



THE BAYONET

BILL HARRIMAN





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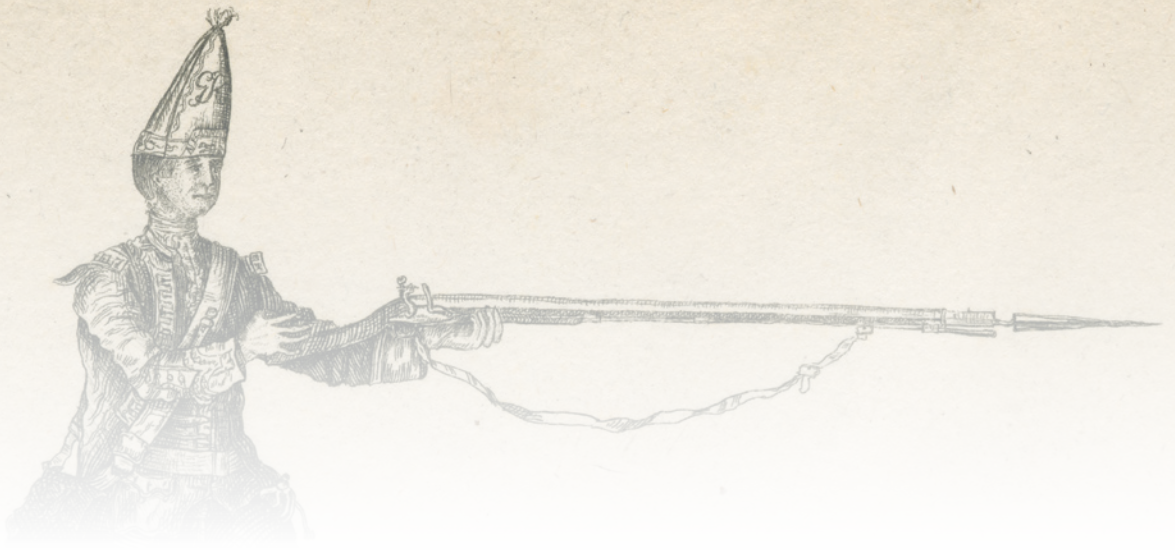


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INTRODUCTION

First recorded in Europe in the 1640s, the bayonet came to be adopted by the world's militaries, seeing combat in a host of conflicts from the Thirty Years' War (1618–48) to the present day. Only the hand grenade has survived for so long in modern warfare, but there have been long periods when that fell into disuse. Although the means by which the bayonet attached to the firearm has evolved, the bayonets issued to troops today have the same essential form and primary function as the first recorded examples: to give the individual combatant a means of defence at close quarters by attaching a blade to his firearm.

While this study seeks to understand and chart the development and use of the bayonet from its European genesis to its eventual global adoption, I have kept in mind that the essential nature of its concept has

The socket bayonet was all but ubiquitous among infantrymen of the Napoleonic Wars (1803–15). Here, a Swiss soldier stabs a French grenadier by using his musket and bayonet in a one-handed extended lunge, in a watercolour signed 'Amsler', c.1806. While this technique extended the 'reach' of the bayonet, it required a very strong arm and wrist to execute effectively. If not delivered with sufficient force and speed, it left the attacker wide open to a lunge in riposte. (Anne S.K. Brown Military Collection, Brown University Library)





Even when rifled firearms were universally issued, the bayonet retained its importance in drill manuals. This plate from *Field Exercise and Evolutions of Infantry* (War Office 1867) depicts postures for close-order troops threatened by enemy cavalry. (Author's Collection)

not changed since an anonymous soldier converted his firearm into a makeshift half-pike by pushing a pointed object into its muzzle during the mid-17th century in a classic instance of necessity and desperation driving invention.

With notable exceptions, the age of the bayonet as a fighting weapon has now passed. The modern soldier has so much technology at his disposal that such an antiquated weapon has no real place in ground warfare today – or does it? In the final analysis, only an infantryman can

'A la baionnette!' French cadets at the Saint-Cyr military academy armed with 8mm M1886 Lebel rifles practise a bayonet charge, c.1890. (Branger/Roger Viollet via Getty Images)





US Army infantrymen at Camp Bowie, Texas, practise the Low Point with .30-06 Model 1917 rifles and sword bayonets, 1918. The Americans found this long combination of rifle and bayonet to be unwieldy in the confines of the trenches on the Western Front during World War I, which is why they issued purpose-made trench fighting knives in 1917 and 1918. (Interim Archives/Getty Images)

take ground from the enemy and hold it against all-comers. If a fixed bayonet and a visceral yell persuade that enemy to yield ground by running away, then that tactical objective has been achieved. The bayonet continues to symbolize and imbue fighting spirit while giving comfort to the ordinary soldier that when all else fails, he or she still has ‘cold steel’ to rely on.

Bayonet evolution (opposite)

This plate shows the development of the bayonet from its early beginnings to the present day. Plug bayonets such as this Austrian example, c.1680 (1), gave the infantry soldier a combined defensive and offensive capability but at the expense of not being able to fire his weapon when the bayonet was fixed. The socket bayonet (2, Winchester Model 1866) avoided that deficiency and survived in use for some two centuries. The *yataghan* bayonet (3, Chassepot Mle 1866) was more of a fashion statement than an effective weapon; its weight made it cumbersome and it was of limited use as a short sword. Only Russia looked backwards after the socket bayonet’s heyday (4, Mosin-Nagant M1891 *Schtyk*). This retrospection emphasized the single purpose of the bayonet, especially as Russian tactical doctrine required it to be fixed at all times.

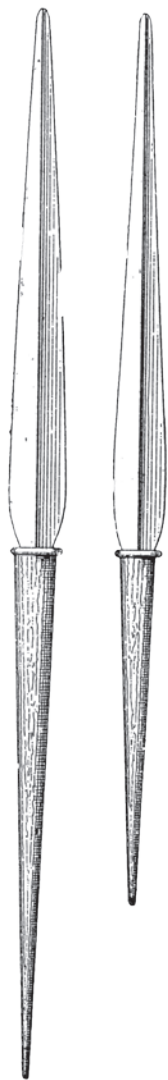
Hitherto, the bayonet blade had protruded from the right-hand side of the barrel, to favour right-handed soldiers. New designs such as the Austro-Hungarian Mannlicher M1895 (5) were not only short bladed but also mounted under the bore axis, making them handier in use and improving barrel harmonics on firing. Because of the obsession with an infantryman’s ‘reach’ with a fixed bayonet, long, straight-bladed sword bayonets (6, US Model 1905 Springfield; 7, Japanese Type 30 Arisaka) proliferated from the start of the 20th century well into World War II. Thereafter, the bayonet was combined with other items (normally wire-cutters) to form a useful, short-bladed, multi-purpose tool which could still be used as a weapon in an emergency (8: US M9, here fitted to an M4 carbine).





DEVELOPMENT

Blades for firearms



In the mid-17th century, musketeers had to carry a lot of equipment with which to load and fire their matchlock muskets. The cumbersome impedimenta, combined with the musket's weight and unwieldy nature, made it impractical for musketeers to wear armour (with the exception of helmets). Consequently, they were very vulnerable to attack – especially by cavalry – while reloading their muskets. Pikemen mitigated this vulnerability but at times when the protective ‘hedge’ provided by their pikes was not available, musketeers had little with which to defend themselves. The cheap and fragile swords issued to musketeers were not very effective and were almost an afterthought. In any case, self-defence with a sword was difficult while still holding a long and heavy musket and its rest. In most circumstances, the use of the clubbed musket butt was the best defence that musketeers could offer.

PLUG BAYONETS

There are many theories about where the bayonet was invented, but its true origin is lost to history. There is an assertion that it was actually a Chinese invention, as the 1606 Binglu manuscript describes and illustrates a plug bayonet which could be thrust into the muzzle of a ‘Mother-and-Son’ gun (a type of primitive breech-loading musket). There is no extant, dateable specimen of this plug bayonet, however, nor is there any evidence to show that its use proliferated thereafter. This is puzzling, for although the Chinese still relied on traditional weapons – bows, lances, swords, etc. – gunpowder firearms were reasonably common, especially in the 19th century. Those muskets which survive from the Ch’ing period are



FAR LEFT

A very ornate English parade-quality plug bayonet c.1680, probably for a grenadier officer in The Honourable Artillery Company. The grip is made from a faceted piece of grey chalcedony and the gilt-copper mounts are decorated with foliage. The flamboyant blade is blued, fire-gilded and engraved with strawberry vines, a grenadier officer and a portcullis. The blade bears the mark of Giles Lyndsey of the London Cutler's Company. (© Royal Armouries X.328)

LEFT

Dating from c.1690, this fine-quality English plug bayonet was probably intended for parade use by an officer of grenadiers or fusiliers. The grip is made of ivory with silver inlay. The brass pommel cap and quillons are decorated with small *amorini*. The flamboyant double-edged blade is struck with cutler's marks, probably from the town of Shotley Bridge in County Durham. (© Royal Armouries X.193)

OPPOSITE

Reconstructive drawings of de Gaya-type plug bayonets illustrating Captain Sir James S.D. Scott's 1863 lecture 'On the History of the Bayonet', delivered to the Royal United Service Institution. These were based on the descriptions from the memoirs of French general Jacques-François de Chasteney, Seigneur de Puysegur and Robert Harford's *English Military Discipline, or, The Way and Method of Exercising Horse & Foot*. (Author's Collection)

long and flimsy, however, making them totally unsuitable for use with a bayonet of any kind.

The first recorded use of the term in the English language is found in the lexicographer Randle Cotgrave's *A Dictionarie of the French and English Tongues* (1611), which defines the item in two ways: 'Bayonnette: f. a kind of small pocket-dagger, furnished with knives; or a great knife to hang at the girdle, like a dagger'. The very vagueness



A plain European military plug bayonet, c.1680. It was intended for use with a flintlock musket, as one quillon has been made thicker than the other to act as a rudimentary hammer for restoring a sharp edge to the flint. (© Royal Armouries X.64)

of this definition has prompted endless speculation as to what these items might have looked like; one thing is certain, however: there is nothing to suggest any military function, let alone one in combination with a firearm.

It is often stated that the bayonet originated in the city of Bayonne in south-west France, as its name suggests. There is no evidence to sustain that assertion, however, even though there are confusing references to 'Bayonne daggers' in late 16th-century French inventories (Blackmore 1971: 66). This is strange given that Bayonne has no history of widespread cutlery manufacture, being notable instead for its ham, a herbal liqueur called Izarra and chocolate. The notion of Bayonne being the bayonet's birthplace is reinforced by the French writer and philosopher, Voltaire, in a verse in Part VIII of his epic poem *La Henriade*, written in 1723. This assertion is entirely without foundation, however, in particular because Voltaire – who was not a military historian – was writing about the battle of Ivry, fought on 14 March 1590 during the French Wars of Religion (1562–98).

Generally agreed to date from 1647, the first reference to the military use of the bayonet in Europe was made by the French general Jacques-François de Chastenet, Seigneur de Puysegur, whose memoirs were published in Paris in 1690. He comments that the soldiers under his command did not carry swords, but bayonets with handles 'one foot' long and blades of the same length; these bayonets could be placed in the muzzle of the soldiers' fusils for defensive purposes (Scott 2010: 336). The original text uses the word *manches*, which not only means 'handles' in French but also 'shafts'. Consequently, the items described by de Chastenet sound more like long-bladed spear heads with short shafts of equal length rather than some sort of knife. They were clearly purpose-made rather than simply an emergency improvisation, and the detailed description provided by de Chastenet suggests they were new. Only a small number of specialists would have carried fusils at this time, and it follows from this that the European bayonet was actually developed in the Netherlands during the Thirty Years' War (1618–48), rather than in the Basque region of south-west France as is popularly supposed.

The emergency insertion of some kind of pointed object into the muzzle of an empty musket to form a makeshift polearm seems to be the most likely explanation for the bayonet's genesis. However, it is unlikely that this was a knife or dagger as their hilt profiles militate against an easy insertion. The most likely candidate would be the head from a broken pike or spear. Such a weapon could be easily found on an early 17th-century battlefield, particularly in the Netherlands where 'vaulting spears' to facilitate the crossing of dykes were routinely carried by light troops.

Once the principle had been established, it was tactically more effective to issue soldiers armed with the lighter fusil with a purpose-made item along the lines of those described by de Chastenet. Musketeers do not seem to have been issued with adequate swords for self-defence. Indeed, the Scottish professional soldier Sir James Turner described them in his

Pallas Armata – written in 1660–71, but only published in 1683 – as ‘despicable’ (Turner 1968: 175). A good spear-point blade in a proper barrel sleeve was a better option than a cheap and flimsy sword.

In 1678, the French historian Louis de Gaya published his *Traité des armes, des machines de guerre*, which includes the first published illustration of a plug bayonet. He describes it as being nearly as long as a dagger, lacking a guard and grip and having a wooden shaft 8–9in long; the blade was 1in wide (de Gaya 1678: 3). The original drawing provided by de Gaya is only 1.9in long, but it is clear that the shaft of the bayonet is gently tapered and bound with thread. The taper was intended to make the bayonet adaptable to various calibres of firearm, while the thread binding ensured a tight fit. The similarity of the de Gaya bayonet to that described by de Chastenet is striking, but no surviving specimen of the de Gaya bayonet is known.

By c.1680, the plug bayonet had evolved into the form recognizable to modern historians. This had a hardwood handle with a long tapering section that terminated in a globular section to prevent the bayonet being lost down the musket’s barrel. It had a crossguard often with one quillon thicker than the other. This was intended to serve as a knapping hammer to sharpen the musket’s flint. Various blade types are encountered – curved, straight (both single and double edged), trowel, and *flamberge* or wavy edged.

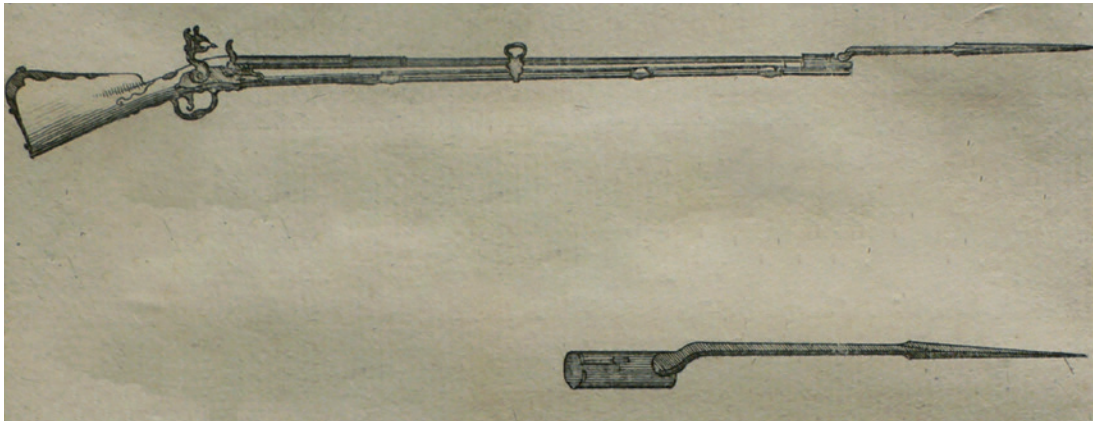
SOCKET BAYONETS

The inability to discharge a firearm with a plug bayonet inserted in its muzzle soon led to the search for a design that would not only alleviate this basic deficiency, but which would also allow the soldier to use his rammer without injuring his hand while loading. The solution was the socket bayonet. This design had a short socket which slipped over the barrel to keep the bore clear for firing and loading while the bayonet was fixed. The blade was attached to a short, curved bar which put it well to the side of the barrel, allowing the soldier to use his rammer without fear of piercing his hand on the point. The blade still remained along the same axis of the bore, allowing it to be used for thrusting, but it was offset from the barrel by a couple of inches – a brilliantly simple solution that was the single most important development in the evolution of the bayonet. Unsurprisingly, the socket bayonet was long lived: for some 200 years it remained the predominant design for bayonets until it was finally superseded in most armies by the introduction of knife bayonets in the 1880s.

The inventor of the socket bayonet remains lost to history. The French military engineer Sébastien Le Prestre de Vauban is often credited with the invention, but there is no evidence to sustain this proposition, although as one of the great military thinkers of the age he is a plausible candidate. Certainly, by 1697 the socket bayonet was sufficiently well known for two distinct types to be illustrated in the French general Pierre Surirey de Saint-Rémy’s *Mémoires d’Artillerie* (1745). At first, socket bayonets had



An early European socket bayonet of the type that many European armies used at the beginning of the 18th century. It is of composite construction with the major elements made separately and then joined by brazing or riveting together. (© Royal Armouries X.83)



'Long-shank' socket bayonet, from Saint-Rémy. This design was unique to France and had largely disappeared by 1730. (Author's Collection)

flat unfullered blades, but the triangular-section blade with two or more fluted faces – a blade form which aided penetration – soon became the norm.

Because of the initial lack of any centralized standardization in the supply of muskets, the earliest socket bayonets had a slit along the socket's longitudinal axis. This allowed the bayonet to fit onto muskets with differing external barrel diameters. The socket could be opened up or pinched closed to achieve a reasonably snug fit irrespective of the musket barrel's diameter.

By the 1730s, sockets started to be fitted with a reinforcing ring around their bases. In the same decade, muskets began to be produced centrally rather than procured regimentally, with standard patterns becoming established. This allowed bayonets to be made with sockets that would fit onto any musket issued by the Ordnance Department of the country that made it. The majority of the new sockets had a Z-shaped, three-step slot cut into them which engaged with a small square lug brazed on the barrel. To fix his bayonet, the soldier pushed it down so that the lug engaged with the slot, twisted it through 90 degrees and pushed down again to lock it in place. (These are known to modern collectors as 'three-motion slots'.)

This locking system was not 100 per cent effective, however, because manufacturing tolerances had to be large to accommodate the work of individual contractors. Bayonets still fell off, particularly when the musket was fired. The Swedes sought to alleviate this problem by the addition of

A replica 'long-shank' socket bayonet for the French 17.5mm Mle 1729 Marine musket. Original examples of the Mle 1729 are only known in very comprehensive collections or as excavated specimens. The blade is 13in long. (Chantel Taylor)





a small wing bolt which applied tension on the barrel. This was both fragile and impractical, however, especially if the soldier's hands were cold or gloved when trying to fix the bayonet in place. Similarly, the Austrians fitted a small spring hook under the musket's muzzle to engage a small hole at the bottom of the socket. This spring hook, too, was easily broken and fiddly to use.

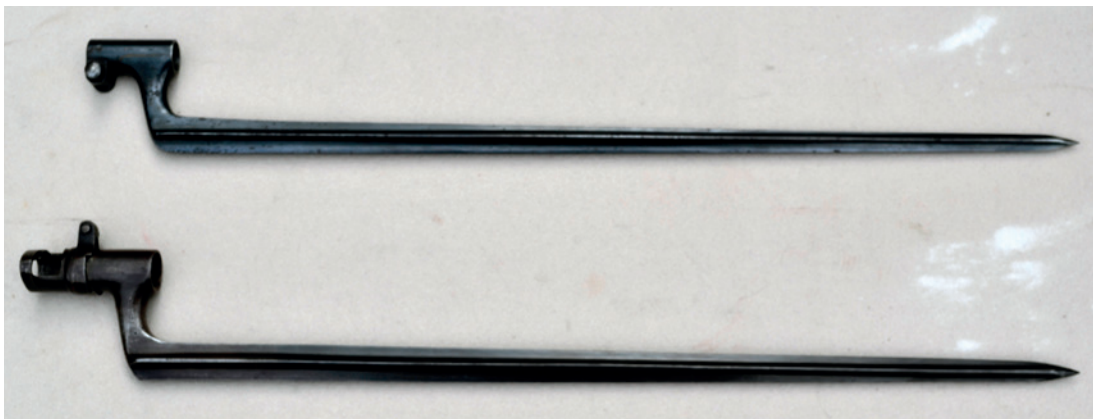
The French solved this problem with the bayonet for the 17.5mm Mle 1777 Charleville musket. This had a rotating locking ring around the middle of the socket which engaged with a small lug on the barrel; an arrangement that held the bayonet securely when fixed. The ring's thickness was increased slightly to ensure that it always locked positively if it or the locking stud wore. The locking ring was the most important improvement in socket-bayonet design and was copied by many countries.

The Danish master armourer Johan C.W. Kyhl designed a spring catch that was adopted by Denmark in 1794. The design featured two 'wings' which could be lifted to release it from the locking stud on the barrel. The British Army first adopted a spring catch in 1814 with the .75 New Land Pattern musket. In 1838, the Hanoverian catch – a small hook which engaged a raised collar at the lower end of the socket – was adopted.

The Honourable East India Company (HEIC) was well ahead of the British military in its adoption of spring catches for bayonets, however. In 1771, the HEIC adopted a short spring (over a two-motion slot) on the bayonets for the .76 'Windus Pattern' musket and equivalent fusil, but abandoned this component in 1802–03, possibly on grounds of cost. In 1819, the HEIC re-adopted the gunsmith Ezekiel Baker's improved version (a longer spring and hence a longer first slot) for its .75 Light Infantry Model muskets only. In 1840–42, it used this spring on its .75

A standard socket bayonet for the .75 British Land Pattern or 'Brown Bess' musket, c.1760. The 'fractional' mark on the socket, 'B/42', indicates the 42nd man of B Company. Prior to precision-manufacturing techniques being adopted, bayonets were a very loose fit on musket barrels, hence the derisive term of 'rickety zigzags' used by Colonel John Mitchell in 1887. (© Royal Armouries X.1502)

Socket bayonets for the Swedish 12.17mm m/1867 rolling-block rifle (below) and its 8mm conversion of 1889. The larger-diameter socket with locking ring of the m/1867 bayonet has been replaced with a brazed-on smaller version incorporating the spring-loaded locking catch on the m/1867/89. The initials of the ordnance inspectors who supervised the conversion are stamped on the socket of the m/1889 version. Blade length is 19.5in. (Chantel Taylor)





Two *Schtyk* bayonets for Mosin-Nagant rifles. Below is an Imperial Russian M1891 (17.6in blade). Above is a Soviet-era M1891/30 bayonet with a spring-release catch instead of a locking ring. (Chantel Taylor)

Pattern C (and early-production Pattern D) muskets but abandoned this component in 1841 in favour of the Hanoverian catch.

In 1844 a small committee was set up at Woolwich in London to consider bayonet catches. The Duke of Wellington, in his capacity as Commander-in-Chief of the British Army, chose a French-style locking ring. This immediately brought him into conflict with George Lovell, Superintendent of the Royal Small Arms Factory at Enfield, who pointed out that this method had been tried in 1794 by the 43rd and 52nd regiments of Foot and had been rejected. Wellington was furious, but eventually the committee chose Lovell's own spring catch, which was fitted to all British muskets from 1844. The modification was short-lived, however, because spring catches became obsolete in Britain when a socket bayonet with a locking ring was adopted for the .58 Pattern 1853 Enfield rifle-musket.

In the mid-19th century, the Austro-Hungarian Army moved away from the three-motion slot and adopted a helical locking slot for rifles built on the Lorenz system. The bayonet turned automatically through about 90 degrees as it was pushed down onto the barrel, making for a smoother drill movement.

As the 19th century drew to a close, the socket bayonet was largely superseded by the knife bayonet, or by the sword bayonet in France and Prussia. One of the last gasps of the traditional socket bayonet was in Sweden in 1889, when bayonets for the 11mm m/1867 Remington rolling-block rifle were modified for use on the 8mm conversion of that weapon. The old socket was removed, a new one brazed in place and the whole bayonet re-blued. When the Imperial Russian Army adopted the 7.62mm Mosin-Nagant M1891 rifle in 1891, it bucked the trend towards knife bayonets by adopting a modernized socket bayonet known as a *Schtyk*, which had a quatrefoil-section blade and a formidable 'screwdriver' point. With minor improvements, this design survived into the 1950s.

SWORD BAYONETS

By the 1740s, some European powers began to raise units of specially designated marksmen armed with rifles as opposed to the usual smoothbore muskets. These units tended to be raised in the Germanic

THE RETURN OF THE SOCKET BAYONET

The socket bayonet re-emerged in the 20th century when Britain modernized its .303 Short Magazine Lee-Enfield rifle. The improved .303 Lee-Enfield No. 4 rifle had a short quatrefoil-section bayonet made from a single forging. Known as the 'Pigsticker', this bayonet could not be used for any other function, except as a landmine probe when fixed to the Pattern 1937 Entrenching Tool helve (handle). Initially made from a single forging with the spike ground to form, wartime pressures saw the bayonet's manufacture being simplified to an unground spike of multipart construction with a diecast socket. Its scabbard was increasingly made of plastic to save metals.

In recent times, some countries have opted for bayonets with hollow handles, in effect socket bayonets. One, colloquially known as an 'apple corer', has been used on the 7.62mm FN FAL and other rifles used by Belgium and by South Africa on its 7.62mm R1 rifle. The British 5.56mm SA80 rifle has a 'socket bayonet' (designated L3A1), albeit one which has an offset clipped-point blade. The L3A1 can be used as a fighting knife in its own right and its scabbard converts it into a wire-cutter. The scabbard also incorporates a small folding saw blade and a sharpening stone.

In what may be the socket bayonet's swansong, Britain's experience of fighting in hot climates spawned a Lightweight Bayonet Requirement competition. One design, provided by the Norfolk-based company Riflecraft Ltd in 2011, was essentially a 22mm flash-hider ring with a simple spike attached to it. The body was made of a polymer for lightness with a non-ferrous core for the spike to prevent detonation of magnetically armed fuzes in land mines and improvised explosive devices. For all of this bayonet's sophistication, however, it would still be recognized for what it was by a soldier in the Duke of Marlborough's army, 300 years earlier.



Two bayonets for the .303 Lee-Enfield No. 4 rifle: left, the No. 4 Mk I with ground blade and right, the simplified Mk 2 with unground blade. The blades are both 8.0in long. (Chantel Taylor)



A crudely made socket bayonet for the British 9mm Sten Mk II submachine gun, c.1942. It was superseded by the ordinary No. 4 Lee-Enfield bayonet when the 9mm Sten Mk V was introduced. The utility of providing a bayonet for so short a firearm as a submachine gun is questionable. (© Royal Armouries XXII.267)



This sword bayonet – a typical example, inspired by the *Hirschfänger* ('deer catcher') style of hunting sword – was originally intended for the Piedmontese M1860 rifle, but was subsequently used on the Carcano M1868 Artillery carbine, a weapon converted to needle-fire. This type of sword bayonet is often mistaken for the Prussian M1810 bayonet due to the passing similarity in hilt shape. Note the long steel locking spring above the mortise slot. The blade is 18.25in long. (Chantel Taylor)

lands which already had a strong tradition of hunting large game (deer, boar, etc.) with rifles. Such units were often given the generic name of *Jäger*, from the German word for 'hunter'. They did not fight in the usual linear formations and each soldier enjoyed the freedom to use stealth and fieldcraft to engage and neutralize important enemy targets such as officers, artillery crews, etc. In the event that the *Jäger* were forced into close-quarter combat, they were issued with a short sword. Because of their hunting heritage, these short swords tended to be styled after hunting swords known as *Hirschfänger*, from the German word for 'deer catcher'. When used for hunting, these hunting swords were used to despatch animals brought to bay by hounds during *par force* hunting.

The *Hirschfänger* tended to have a straight, single-edged blade, solid-brass grip with a short quillon, and a pommel in the form of a stylized eagle's head. These hunting swords became bayonets which were fixed to the rifle's muzzle by means of a bar and a spring catch. As early rifles had significantly shorter barrels than muskets, there was always concern about defending against cavalry attack. Consequently, *Hirschfänger* bayonets tended to have longer blades than conventional socket bayonets in order to achieve a similar 'reach'.

Britain did not have a tradition of hunting and shooting large mammals with rifles. Consequently, when the British Army adopted the .625 Baker rifle for the 95th (Rifle) Regiment of Foot in 1801, it issued a sword bayonet with it that revealed no influences of hunting weapons. It was based on an infantry 'hanger' (a short sword) with a 23in single-edged spear-point blade and a brass stirrup hilt with a knuckle-bow, and was fixed on the right side of the muzzle and slid onto a bar where it was secured by a spring catch.

The sword bayonet for rifles survived for less than a century due to the universal adoption of the rifle-musket from the 1840s onwards, which resulted in a rapid decline in the use of specialist rifles and their sword bayonets. The rifle-muskets' longer barrels meant that the standard socket bayonet could be used with these arms. The use of the term 'sword bayonet' persisted into the early years of the 20th century to describe any bayonet with a long blade, however.

A British Pattern 1871 cutlass bayonet for the Martini-Henry rifle, converted from the Pattern 1859 cutlass bayonet with straight blade and reduced guard. The knurled black leather-covered grips are typical for British sword bayonets for the period 1853–88. (© Royal Armouries X.1367)





SPRING BAYONETS

Although the bayonet was initially conceived as a complementary weapon to the military musket, it did not take long for it to be applied to civilian firearms as well. At first, its application was in the same form as military arms, with bayonets being provided for some sporting longarms, especially those intended to hunt large, dangerous game such as wild boar. A bayonet offered last-ditch protection from an attack by a wounded or enraged animal, but it was equally useful when applied to firearms for self-defence.

On 9 March 1781, the Birmingham gunmaker John Waters was granted a British patent (No. 1284) for a bayonet attached to a firearm which was deployed using spring power when a small catch was released. While the patent only referred to pistols, Waters' spring bayonets are found fitted to both blunderbusses and pistols. Their blades are invariably triangular in section. When applied to blunderbusses, they are generally mounted on the top of the barrel with a hinge at the muzzle. There is a powerful leaf spring immediately behind this which is compressed when the bayonet is folded backwards. The bayonet's tip engages with a sliding, hooked catch on the breech. To deploy the bayonet for use, this catch is slid to the rear so as to disengage the bayonet tip. The spring pushes the bayonet upwards and forwards until it is fully deployed, after which it is locked in place by a small square projection located on the muzzle. The bayonet can be unlocked by means of pressure on a mushroom-headed pin. The deployment mechanism is similar for pistols, but the release catch

Made c.1785 by John Waters of Birmingham, this flintlock blunderbuss pistol has a spring bayonet under the barrel axis. (© Royal Armouries XII.1719)

Dating from c.1790, this English double-barrelled flintlock blunderbuss was made by J.W. Richards of Birmingham. A spring bayonet is mounted on the top rib over the axis of the barrels. (© Royal Armouries XII.1770)



The folding bayonet on a 6.5mm
Type 44 (1911) Arisaka carbine.
The spike is 13.75in long.
(Chantel Taylor)



is combined with the trigger guard. The tip of the blade is retained by a notch and is released when the guard is slid to the rear.

Although Waters was granted a patent for spring bayonets, it is clear that he had little claim to be their inventor, there being strong evidence that the Frenchman Isaac de la Chaumette (described as an ‘ingenier’ in the patent specification) had introduced the concept in his 1721 patent. The legal challenge for this invention, however, came from fellow Birmingham gunmaker, William Grice. On 5 June 1782, Grice petitioned for the vacation of Waters’ patent, claiming that he had made coach guns fitted with spring bayonets for the past five years and that Waters had stolen his invention (Evans 1991: 14). Grice was not successful in his suit and Waters retained (somewhat unfairly) his patent. There is reference to the Waters patent in the advertisement of the gunmaker and sword cutler Thomas Gill, who was active in Jennens Row, Birmingham in the period 1782–1801 (Nie & Bailey 1978: 37). Gill had probably entered into some financial arrangement with Waters to make pistols with spring bayonets, at least until the patent expired in 1795.

The English novelist Emily Brontë must have encountered a pistol with a spring bayonet and have been sufficiently impressed by its formidable aspect to include it in her 1847 novel, *Wuthering Heights*, in which she arms the character Hindley Earnshaw with one: “Look here!” he replied, pulling from his waistcoat a curiously-constructed pistol, having a double-edged spring knife attached to the barrel. “That’s a great tempter to a desperate man, is it not?” (Brontë 1847: 315). Spring bayonets continued to be fitted to blunderbusses and pistols well into the 19th century. Their demise came about with the perfection of the revolver by Samuel Colt in 1836, after which there was simply no need for an auxiliary weapon when the firearm itself could fire five or six shots without reloading.

While the spring bayonet was only fitted to civilian firearms in the 18th and early 19th centuries, its invention heralded its adoption by the world’s militaries decades later, in both blade and spike forms. The introduction of a folding bayonet on the Italian 6.5mm Mannlicher-Carcano carbine was undoubtedly driven by the fact that a conventional bayonet suspended from a waist belt is a serious encumbrance to a mounted man. By this time, the cavalry of most nations carried their weapons, whether sword or carbine, on the saddle. The consequences of a fall while encumbered with a sword and carbine made the chance of injury greater for the rider while damaging the weapons as well.

The principal function of cavalry was still to engage the enemy with sabre or lance, so a bayonet for a cavalryman was of limited utility and really only useful when he was acting as a dismounted sentry or guarding the horses at grass. The folding bayonet was only ever designed as a defensive weapon to be used in an emergency. The same holds true for the Japanese 6.5mm Type 44 Arisaka carbine and its folding spike bayonet. By the time the Type 44 was accepted into service by the Imperial Japanese Army in 1911, the functions of the cavalry of most countries were scouting, supporting infantry breakthroughs and guarding lines of communication rather than close-in fighting.

When the Soviet armed forces adopted the 7.62mm Mosin-Nagant M1944 carbine into service, it was intended to arm specialist personnel such as artillery and mortar crews, drivers, medics, engineers, signallers and anyone who needed a short firearm for defensive purposes. The permanent attachment of a folding bayonet coincided with Soviet tactical doctrine that a bayonet should be always attached to its firearm. Because the People's Republic of China used obsolete Soviet machinery to make its own version of the M1944 (the Type 53), it was inevitable that the folding bayonet was part of the Chinese carbine; and when both the Soviet Union and China adopted the 7.62mm Simonov SKS self-loading rifle in the late 1940s/early 1950s, it was logical to retain the folding bayonet as the SKS was a carbine-length firearm. The retention of a folding spike bayonet by the Chinese for the 7.62mm Type 56 Kalashnikov assault rifle seems to have been force of habit, however, that lapsed with the adoption of the 5.8mm QBZ95 assault rifle, which uses the Type 87 bayonet, a copy of the US M9. The Soviet Army did not follow suit and always issued a knife/wire-cutter bayonet for the 7.62mm AK-47 assault rifle and its successors.

The motivation behind Czechoslovakia's adoption of the short-lived 7.62mm CZ52 self-loading rifle with its unique side-hinged bayonet remains unclear. In all probability it stemmed from a desire to use a domestically designed and produced rifle in an era when the Soviet Union dominated the Warsaw Pact. That desire to remain different was brutally suppressed by the Soviet invasion during the Prague Spring of January–August 1968.

YATAGHAN BAYONETS

The universal supremacy of the socket bayonet was challenged, albeit briefly, during the four decades that followed 1840. For many years troops fielded by the Ottoman Empire and elsewhere in the Balkans had used a short sword known as the *yataghan*. Although the exact form of the hilt differed from region to region, this weapon was characterized by



French bayonet development in the mid- to late 19th century is shown by these four bayonets (bottom to top): Mle 1842 (23in blade), Mle 1866 Chassepot (22.5in blade), Mle 1874 Gras (20.5in blade) and Mle 1886 Lebel (20.5in blade). The French adopted bayonets that ranged from the extremely cumbersome to the especially fragile over a 46-year period. The Mle 1866 Chassepot *yataghan* bayonet had a screw-adjustable muzzle ring that could be precisely adjusted to the exact external diameter of a rifle's barrel for a secure fit. (Chantel Taylor)

OPPOSITE

Carte de visite of Sergeant Henry G. Lillibridge of Company H, 10th Rhode Island Volunteer Infantry. He is armed with a .58 Model 1841 'Mississippi' short rifle and Model 1855 sword bayonet with *yataghan* blade. (Library of Congress, LC-DIG-ppmsca-34602)

a single-edged recurved blade and was efficient both as a cutting and thrusting weapon. The recurved blade form put the cutting edge at the weapon's point of percussion in front of the rest of the blade, concentrating the force of the cut while aiding balance. The *yataghan* was equally effective for thrusting, as its point was in line with the rest of the blade at the hilt. While the *yataghan*'s form was common to the Turkish world and the Balkans, it also appeared in a modified form in North Africa as the *flyssa*. Here, blades tended to be longer and straighter, but the main elements of the *yataghan*'s form are readily discernible.

In 1840, the French armed forces introduced a sword bayonet of revolutionary form which incorporated a ridged brass grip, a guard with a quillon, a muzzle ring and a *yataghan* blade. It was designed for the 18mm *carabine du munition* or 'du Thierry' rifle, which had been introduced to arm the *chasseurs à pied* (light infantry). This 'du Thierry' rifle had a chambered breech following the Delvigne system. As its barrel was only 32.5in long, it was felt that in order to give the soldier the necessary 'reach' to defend himself against cavalry, a bayonet with a longer blade was needed. Initially, the Mle 1840 sword bayonet had a 20.25in blade; when the Mle 1840 was improved and redesignated the Mle 1842, however, the blade was extended to nearly 23in. At the same time the guard was changed from brass to harder and more durable steel.

The French sword bayonet was attached to the rifle by means of a short bar brazed onto the muzzle. This engaged with a slot on the back of the bayonet's hilt. With the bar and slot conjoined, the bayonet was aligned to the barrel; when slid to the rear, the large muzzle ring supported it and a T-shaped tenon entered a slot in the hilt where it locked with a spring-loaded catch. This catch ran transversely through the pommel. The release button was on the left side; when pressed, the spring catch disengaged, allowing the bayonet to be removed.

France's motives in adopting this new type of bayonet are obscure, but Richard F. Burton gives a valuable clue in his work *The Book of the Sword*. According to Burton, Colonel Guillaume Stanislaus Marey, the commanding officer of the 1st Regiment of Cuirassiers, was an ardent exponent of the *yataghan*'s recurved blade, which Marey believed coincides with the wrist's motion in cutting (Burton 1884: 134). Marey wrote *Mémoire sur les armes blanches* while in garrison at Strasbourg and it was published in 1841. The book was subsequently translated into English and added to by Lieutenant-Colonel Henry Hamilton Maxwell of the Bengal Artillery (Marey 1860). Although Marey published his book after the adoption of the Mle 1840 sword bayonet, it may well have been that he was influential among those in French military circles who were drawn to the 'scientific' principles that he later expounded in print.

As France led international military fashion at the time of the Mle 1840 sword bayonet's adoption, it was inevitable that other powers would follow suit and adopt *yataghan* bayonets for their muskets and rifles. Only Prussia did not do so. Certainly, *yataghan* bayonets looked very impressive when fixed. Commercial manufacturers were not immune either, and often offered rifles with either socket or *yataghan* bayonets depending what the customer wanted. Initially, there seems to have been



BAYONET MARKINGS

Most bayonets carry some sort of markings, which can be a great aid towards proper identification and establishing an individual bayonet's provenance. These markings fall conveniently into four major categories.

The first category is composed of **manufacturer's marks**. These will normally be found stamped onto the ricasso and may simply state the name of the arsenal at which the bayonet was made if of government manufacture, e.g. 'Amberg' immediately reveals that the bayonet is Bavarian. Some arsenals have logos, e.g. an arrow indicates the Izhevsk Mechanical Plant.

If of commercial manufacture, the maker will be delineated by a trademark, e.g. a balance or pair of scales identifies bayonets manufactured by Alexander Coppel of Solingen. Alternatively, the maker's name may be written in plain script, e.g. 'Robt Mole, Birmingham'. In both cases this may indicate a bayonet made purely for commercial sale or a bayonet made for a government contract because the state facility was unable to cope with production demands. The trick is to differentiate between the two. Generally speaking, a government contract bayonet will have Ordnance acceptance marks as well.

The exception to the general rule concerns French *yataghan* and sword bayonets manufactured from 1840–86. Here the arsenal, date of manufacture and sometimes the model are engraved on the back of the blade in flowing script.

The second category of bayonet markings includes those indicating **government ownership** and **Ordnance marks**. These are generally small punched marks, applied after manufacture by government inspectors who have satisfied themselves that the bayonet is made to the correct specification and is of sufficient quality to be fit for service. This was particularly important in the case of a commercial contract as the contractor would not be paid until the government acceptance mark was applied. Sometimes inspection marks are the initials of the inspectors themselves.

In the case of empires, kingdoms and states other than republics, government acceptance marks generally take the form of a small crown surmounting a letter. Accordingly, it pays to be familiar with the distinction between national crowns, and a book on heraldry will repay careful study. Sometimes the Royal Cipher is applied; these take the form of a crown over the sovereign's initial(s), the regnal number and 'R', standing for *Rex* (King) or *Regina* (Queen), e.g. 'GVR' is Britain's King George V. A good dictionary of monarchs and other rulers is a useful tool for dating a bayonet from any Royal Cipher. Where republics are concerned, their property is marked with the national emblem, e.g. a hammer and sickle for the Soviet Union or a stylized eagle's head for the United States.

A series of **letters and numbers** generally indicates that a bayonet was matched to a rifle with the same number. This is particularly so in the case of Tsarist Russian and later Soviet Mosin-Nagant M1891 and M1891/30 socket bayonets. Russian/Soviet tactical doctrine required the bayonet to be fixed to the rifle at all times. Because this had an effect on the harmonics of the barrel, rifles were zeroed at the factory and marked with the rifle's serial number. However, the exigencies of war often meant that a rifle became separated from its original bayonet. Some number combinations represent the rifle/bayonet's serial number and the date of manufacture. For example, the bayonets supplied by Prussia to the Schleswig-Holstein rebels in 1848 are marked with both a serial number and a date.

Some countries applied **unit markings** to their bayonets at a particular time. Such markings are of the greatest interest to collectors as they represent a clear link between a bayonet, a regiment or battalion and a campaign in which that unit was engaged. Placing any military artefact into an accurate historical context makes it far more desirable to collectors than any similar anonymous example. In all cases, a good working knowledge of the organization and composition of the armed forces of a country is



Danish M.1889/93 Krag-Jørgensen knife bayonet, dated 1901. Note the regimental property marks (one cancelled) on the pommel. This bayonet was made by Alexander Coppel of Solingen by the unusual method of being milled from a solid steel billet. The scabbard features the retaining catch protected by British Patent No. 5684 of 2 November 1882. The blade is 9.0in long. (Chantel Taylor)

needed to make sense of any such markings. The following countries are known to have applied unit markings to their bayonets routinely.

During the period 1750–80, British socket bayonets were marked with what are known as ‘fractional’ marks because of their visual similarity to vulgar fractions. These often take the form of the regiment’s number in Latin numerals or Arabic numbers, applied above the company and the number of the man within that company, e.g. ‘VI/9 1t G’ for the ninth man of the 6th Company of the 1st Regiment of Foot Guards. Well-executed engraving suggests that the work was carried out by the official engraver of the Board of Ordnance. Cruder work was done at regimental level without any form of standardization. The practice appears to have largely died out before the American Revolutionary War (1775–83).

The Honourable East India Company often marked its property with a distinctive heart-shaped marking.

During the period 1860–1914, the War Office issued detailed instructions for the marking of arms. Socket bayonets were either marked on their sockets or on the ricasso. Sword bayonets were marked on the side of the pommel away from the body when the bayonet was worn. Pattern 1888, Pattern 1903 and Pattern 1907 sword bayonets frequently bear unit markings on their pommels. Marking stopped during the early months of World War I as unit armourers had more important calls on their time.

Germany was the most prolific of all powers when it came to marking weapons. German bayonets will be found marked along the left side of the guard according to a formulaic system, with the major unit followed by the sub-unit and the number of the weapon issued to that sub-unit. Hence ‘7.R.3.27’ on a Mauser M1871 bayonet indicates Grenadier-Regiment König Wilhelm I (2. Westpreussisches) Nr. 7, 3rd Company, individual weapon no. 27. The unit marking will also be found applied to the inside of the scabbard locket or top. Sometimes, a unit marking was cancelled by means of fine hatching prior to a bayonet being reissued to another unit. In Germany, handbooks governing the markings on arms were issued in 1877, 1909, 1923 and 1934, each with its own series of updating amendments. Those issued by the Kingdom of Bavaria often differed from those of Prussia. Generally, any Bavarian bayonet unit marking will incorporate an upper-case ‘B’ after the major unit designator.

While some Austro-Hungarian bayonets are encountered with unit markings, many are unmarked. Those that are marked utilize two different systems. The older system resembles the British ‘fractional marks’ described above. For example, ‘27.R 2.B’ over ‘5. 134’ indicates that the bayonet is the 134th weapon issued to the 5th Company of the 2nd Battalion of Infantry Regiment 27. The newer system omits sub-units and weapon number and simply concentrates on the main unit, e.g. ‘6 UR’ indicates *Uhlán* (Lancer) Regiment 6. Austro-Hungarian sword bayonets tend to be marked

on the quillon hook, socket bayonets on the socket and later knife bayonets on the top of the pommel.

During the 19th century, Denmark applied unit markings to many of its weapons. The markings follow the Prussian (later German) model but stop at the sub-unit and do not include individual weapons. For example, ‘H.L.R. 4E.’ indicates the 4th Squadron of the Holstein Lancer Regiment. Markings have been noted with simple linear cancellation marks.

Swedish socket bayonets for the m/1867 Remington rolling-block rifle and knife bayonets for the Mauser m/1896 rifle with unit markings are often encountered. The best source for interpreting these markings is provided by Per Holmbäck (www.holmback.se).



German S 71 bayonet and scabbard locket showing very clear regimental markings. (Chantel Taylor)

a tendency to reserve *yataghan* bayonets for NCOs, with ordinary soldiers retaining the socket bayonet. This was probably due to NCOs being issued with shorter firearms in some armies. The *yataghan* bayonet then became a badge of office as well.

TROWEL BAYONETS

A recurring theme of bayonet design is the combination of the bayonet with another object, usually a tool. The universal issue of rifled arms from the 1850s increased the effective range of the soldier's rifle to the extent that the ability to throw up temporary cover became imperative. Although linear battle formations survived well into the 1860s, many soldiers understood that their survival depended on hastily constructed cover from fire, and improvised digging tools such as pointed sticks, cups and canteen halves were routinely used for this task. The US military realized this in the years which followed the American Civil War (1861–65).

In 1868, small quantities of a trowel-shaped bayonet designed by Brevet Lieutenant Colonel Edmund Rice were tested by the US Army Corps of Engineers. Their report was favourable and a further 500 were ordered to be manufactured and issued to company commanders in the 3d and 5th US Infantry for field trials. These bayonets had conventional socket-bayonet handles and broad trowel-shaped blades. When fixed on the rifle the blade protruded from the right side of the barrel.

When the trials were complete, of the 50 officers who reported on the Rice trowel bayonet, 46 voted for its adoption with only four against. Those who elaborated on their reasoning stressed the speed at which soldiers could construct temporary protective earthworks (these would be termed 'shell-scrapes' today). Much store was also put on the bayonet's appearance. First Lieutenant W. Mitchell of the 3d US Infantry commented that 'I am of the opinion that its effect on an enemy would be far more demoralising, it being more appalling in appearance' (Officers of the 3d US Infantry 1874: 14).

Armed with these reports, the Small Arms Board considered the question of adoption. Three officers, Brigadier General Alfred H. Terry, Major Marcus A. Reno and a Captain Livingstone, voted in favour while two others, Colonel Peter V. Hagner (designer of the ammunition pouches bearing his name) and Colonel Henry B. Clitz of the 10th US Infantry, voted against. Colonel Hagner's objections were mainly that the musket would be damaged if the trowel bayonet was used while fixed clogged with dirt; Colonel Clitz's concerns centred on the danger of combining two useful items to form an inferior hybrid. In a concise but carefully reasoned response he said:

The trial of Rice's trowel bayonet before the Board has convinced me of the great value of a light intrenching tool in the hands of each soldier: but I am not at all satisfied that we should not spoil the bayonet and adopt an inferior intrenching tool by trying to combine the two. I should prefer to recommend that the present triangular



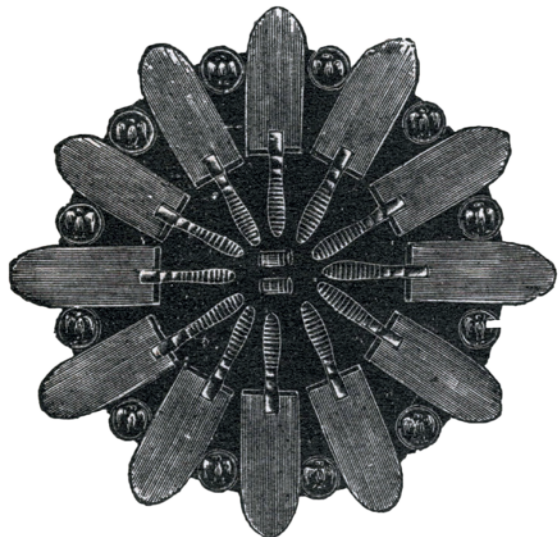
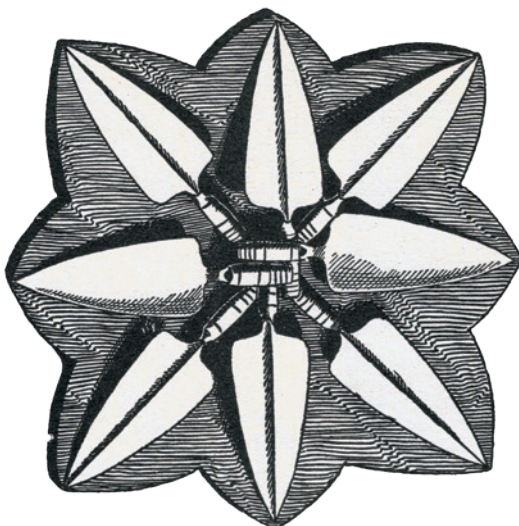
bayonet be retained and a light steel intrenching tool with wooden handle and of improved pattern be issued to each enlisted man of infantry, artillery and engineers as part of his equipment. I therefore vote against the adoption of Rice's trowel bayonet. (Officers of the 3d US Infantry 1874: 36)

A US Model 1873 Rice-Chillingworth trowel bayonet for the Springfield 'trapdoor' rifle. Perhaps the most grotesque of all the bayonet/tool combinations, it was ineffective for either function. (© Royal Armouries X.296)

The majority vote carried the day and 10,000 Model 1873 trowel bayonets were ordered to be made. (The actual production total was 10,706). They had improved handles made after US patent 125,720 (1872), awarded to Felix Chillingworth and Ira Merrill, and then US patent 151,238 (1874), awarded to Chillingworth and Henry Metcalfe. The adoption of the trowel bayonet is especially bizarre as the US Army was issued with the Model 1873 entrenching knife in 1874. This was not dissimilar in form to the Model 1873 trowel bayonet, but as it was designed as a single-purpose implement it was of far greater utility.

The Model 1873 trowel bayonet only lasted in service for eight years, being declared obsolete in 1881. It is perhaps as well that its life was so short and that it was never tested in combat against troops armed with modern weapons, because any army having to face US soldiers so armed could only conclude that it was being attacked by men with strangely

The ultimate fate of many US Model 1873 Rice trowel bayonets. In 1927, the New York army-surplus dealer Francis Bannerman Sons was offering them at 85 cents each, for use in making decorative trophies of arms (left). The same advertisement shows a similar decoration made with Model 1890 Entrenching knives (right). (Author's Collection)



shaped shovels. Eventually, the surviving Model 1873 trowel bayonets were sold as surplus by the US Government. In the 1927 catalogue, the New York arms dealership Francis Bannerman Sons, Inc. reported that they had upwards of 4,000 trowel bayonets in their brass-mounted leather scabbards. These were available at 85 cents each.

ROD BAYONETS

By the middle of the 18th century, most military muskets were equipped with iron rammers. This not only prevented the soldier's firearm from becoming temporarily useless when a wooden rammer broke, but increased infantry firepower by facilitating quicker loading. Hitherto, the charge had to be carefully tamped home with a wooden rammer; an iron one could be dropped down the barrel in a single stroke to seat the powder, ball and retaining cartridge paper into the chamber. As the rammer was carried permanently under the barrel, it was inevitable that someone should seek to combine its function as a loading rod with that of a bayonet.

The first (and it seems only) European power to do this was the Kingdom of Denmark–Norway in 1789. The 16 *lödig* (approximately 17.7mm) M/1789 *Skarpskyttergevär* (sharpshooter musket) was equipped with a 40.25in rod bayonet that doubled as a rammer. The lower end was of a circular section which terminated in a slight swell in much the same way as many other contemporary military rammers did. The upper portion was a triangular section which terminated in a sharp point. When deployed as a bayonet, the rammer was turned around and pushed into the substantial brass ramrod pipes until a spring mechanism locked it into place by means of a notched band that divided its two stages.

Ingenious though the rod bayonet may have been, it never caught on. Its next incarnation would take another 44 years to materialize – and then on another continent. In 1819, the United States adopted a breechloading flintlock rifle made after John H. Hall's patent of 21 May 1811. In 1833, a series of cavalry carbines on the same principle were adopted, the first model of which was fitted with a triangular-section, sliding-rod bayonet. When in the fixed position, the Model 1833 Hall carbine's bayonet projected 21.5in beyond the muzzle. The awkward, spring-loaded locking mechanism was almost impossible to use on horseback because the blade had sharp edges, which gave rise to the very real possibility of the soldier cutting himself while deploying or retracting his blade.

The rod bayonet applied to a cavalry carbine was of little utility to the soldiers who had to fight the United States' Native American foes, who were masters at hand-to-hand combat. The Model 1833 carbine was issued to soldiers of the 1st US Dragoons, who were fighting the Seminoles in Florida. A short thrusting weapon with a flimsy blade was no match for the Seminole warriors, who were well equipped with effective close-quarter weapons – knives, tomahawks, clubs, etc. Mechanically, the Model 1833 carbine did not distinguish itself either, but while such faults

as gas leakage and breech opening lever defects were improved, the rod bayonet remained stubbornly resistant to any change. Its locking mechanism was particularly prone to seizing when rusted, as noted by Captain Benjamin L. Beall of the 2d US Dragoons in a letter of 12 March 1839 (Wainwright 1999: 19).

Between 1837 and 1840 a further 2,020 slightly modified Hall carbines with rod bayonets were made at the Harper's Ferry Armory in Virginia. While the locking mechanism of the Model 1837 was essentially the same as that of the Model 1833, the blade was slightly shorter with a protrusion of 18.25in when deployed. Thus ended the first phase of the US love affair with rod bayonets.

The next phase came in the 1880s, but quite why the US military persisted with the notion of rod bayonets is unclear. Various reasons such as general convenience, reduction in the soldier's load and production-cost reduction were advanced, but none appears to have been evidence-led. A cynical explanation is that rod bayonets were espoused on a theoretical basis only by senior officers who had never led men in battle and who did not understand the combat realities of such implements. The most plausible explanation supported by evidence is that the US Army was looking at adopting entrenching knife bayonets and that the conventional socket bayonet was to be phased out when they were adopted.

On 22 December 1879, the redoubtable General of the Army William T. Sherman wrote to the Adjutant General, Brigadier General Edward D. Townsend, setting out his views. Sherman believed that while it was important to find a suitable entrenching knife, its adoption had to coincide with the replacement of the current bayonet in favour of a rod bayonet, thereby meaning the bayonet scabbard could be replaced by a scabbard for the entrenching knife (Hardin 1977: 69). Six months later, US Secretary of War Alexander Ramsey approved the issue of 1,000 ramrod-bayonet rifles with a similar number of wooden handled knives. The .45-70 Model 1880 Springfield 'trapdoor' rifle was provided with a 39.56in rod bayonet of unfluted triangular profile which protruded 15in when deployed. The rod bayonet was intended to be used in conjunction with a wiper and headless cartridge base extractor stored in the rifle's butt. It reduced the production cost of the rifle by 91 cents and the soldier's load by a mere 10oz. The method of deployment and fixing in place was rather like that of the old Hall carbine, but with the addition of a locking wedge designed by Colonel James G. Benton. Two years later the design was applied to the .45-70 Model 1882 Springfield short rifle.

The locking mechanism for the triangular-section rod bayonet was not especially satisfactory, particularly as it allowed the bayonet to jump forward by an inch or two every time the rifle was fired. Eventually, the triangular-section was reconfigured and improved as a round-section rod with a more positive locking mechanism. The tip was knurled to enable better purchase when deploying or stowing the implement. The point was in the form of a symmetrical triple-scalloped 'Y'. This streamlined rod bayonet was adopted for all US service rifles in 1889, but the decision was made first to exhaust the supply of conventional socket bayonets.

A view of the rod bayonet of a .45-70 Model 1888 Springfield 'trapdoor' rifle. It slides forward on the double-grip mount and is locked in place when fully deployed. The rod is 13.5in long. (Chantel Taylor)



British Pattern 1842 sapper's fusil sword/socket bayonet, c.1842; a good example of the drive to combine a bayonet with a useful tool by having saw teeth on the back of the blade. The result was a cumbersome bayonet, a poor sword and a tool of dubious utility. (© Royal Armouries X.134)



The rod bayonet did not figure in the US adoption of the .30-40 M1892 Krag-Jørgensen rifle, which was issued either with a knife bayonet copied from the Swiss Schmidt-Rubin M1889 or with a bowie-knife-blade model adopted in 1898. The rod bayonet was revived, however, with the Mauser-actioned .30 Model 1901 and .30-06 Model 1903 Springfield rifles – until President Theodore Roosevelt, a former soldier himself, intervened. In his famous letter of 4 January 1905 to Secretary of War William H. Taft, the Commander-in-Chief made clear his low opinion of the rod bayonet, advocating instead a short triangular-section bayonet (Wainwright 1999: 21). The President's views stemmed from a dramatic episode. Reportedly, Brigadier General William Crozier, Chief of Ordnance, extolled the virtues of the rod bayonet and used one to pierce some pine boards. Upon seeing this, the President called for a Krag rifle with a knife bayonet. The correspondent 'JMC' of the *Public Ledger* newspaper for 10 April 1905 reported that after making a few exploratory flourishes, the President caught the ramrod bayonet with the Krag bayonet and cut it in two (Hardin 1977: 75).

Such a practical demonstration from the nation's President sounded the death knell for the rod bayonet. A committee of officers, all with combat experience in the Philippines, was hastily formed and on 17 March 1905 its members recommended the adoption of a sword bayonet with a 16in blade based on the Krag-Jørgensen model. Crozier approved the choice 11 days later. The Model 1905 Springfield sword bayonet would go on to serve the US soldier – albeit with a shortened blade – until the mid-1950s. As for the dreadful rod bayonet, it was consigned to the dustbin of history.

Prussia flirted briefly with a rod bayonet on its 15.4mm M1854 Dreyse needle rifle, the so-called *Pikenbüchse*. This was originally conceived for the *Jäger* but was not popular with them. The M1854 Dreyse was used in the 1864 campaign against Denmark and the 1866 campaign against Austria-Hungary. Thereafter common sense prevailed, and no further rod-bayonet rifles were produced.

SAW-BACKED BAYONETS

The idea of adding saw teeth to the back of an edged weapon's blade dates back at least to the 17th century, when many hunting swords or 'cuttoes' had saw-toothed backs. This enabled them to be used as bone saws when dismembering the carcass of a large animal or for cutting wood to use as fuel or carrying poles. Later, some military fascine knives were made with saw-toothed backs, notably the Prussian M1810, M1841 and M1855 *Faschinenmesser*. Fascine knives were widely issued to engineers, pioneers and foot-artillerymen; smaller numbers were issued to other arms as circumstances dictated.

Given the utility of a saw that was always to hand, it was inevitable that some bayonets would be made with saw-toothed backs, especially those issued to pioneers, engineers and artillerymen. The Prussian Army



appears to have started the trend with its M1865 *Pionierfaschinenmesser*, a formidable bayonet with a 19in saw-toothed blade issued for the Dreyse rifle. A small number of other countries soon followed Prussia's lead. The Belgians issued a saw-backed bayonet for the 11mm M1868 Terssen rifle and the Swiss issued ones for their country's 10mm Vetterli and 7.5mm Schmidt-Rubin rifles.

A British Second Pattern bayonet with a saw-toothed back for the Baker rifle is known, but this may have been an experimental design or for a Volunteer unit. The Pattern 1856 Pioneer sword was the first and only pattern of sword with a saw-backed blade adopted by the British Army, although there had been earlier non-regulation regimentally sourced examples in service. The British armed forces' first saw-toothed bayonet manufactured in large numbers was that designed by Lord Elcho in 1871 for the .577/450 Martini-Henry rifle. This had a blade culminating in a leaf-shaped point designed for digging and chopping. A section of the back of the blade was toothed for use as a saw. Elcho's bayonet was not widely adopted due to its prohibitive cost of 14s 6d as opposed to 3s 11½d for the standard socket type. The Elcho was followed by the Pattern 1875 and Pattern 1879 sword bayonets, the latter made for the .303 Martini-Henry Artillery carbine.

The German Empire was by far the greatest exponent of saw-backed bayonets from its inception in 1871 onwards, and virtually every German bayonet model was made in a saw-backed version as well as the simple blade. The proportion of saw-backs to plain blades is estimated at 6 per cent. Issue on that scale would allow an infantry company to have sufficient saw-backed bayonets to deal with any minor wood-based obstacle. The best-known and most iconic of all German saw-backed bayonets was the S 98/05, known to collectors as the 'butcher knife' as its single-edged blade has a swollen point section reminiscent of some meat-processing knives. The S 98/05 was manufactured in huge numbers until 1918, with a high proportion of them saw-backed versions.

The saw-backed bayonet did not survive World War I, however, and the Swiss M1914 was the last of its kind to be adopted by any country.

The Pattern 1871 Elcho sword/saw bayonet for the Martini-Henry rifle was one of the few instances when a weapon/tool combination was successful. Even then it was very expensive to manufacture and made the rifle muzzle-heavy when fitted. (© Royal Armouries X.425)

A Pattern 1879 saw-backed sword bayonet for the .303 Martini-Henry Artillery carbine. (© Royal Armouries X.427)





USE

The bayonet goes to war

From its inception, the bayonet began to change not just the composition of armies but their very tactics as well. The bayonet's long service life can be divided into five phases.

A REVOLUTIONARY WEAPON

As readily portable and reliable firearms began to proliferate in European armies from the mid-16th century onwards, so did the pike-armed troops needed to protect these firearms' users from cavalry attacks while they reloaded. This was a logical development of the complementary use of missile and shock troops during the medieval period; while the English deployed archers alongside units of billmen, the French supported blocks of men-at-arms with crossbowmen. The lightly armoured missile troops started inflicting attrition on the enemy at long range; the more heavily armed close-quarter or shock troops dealt with the (hopefully) disordered enemy troops in hand-to-hand combat.

By the beginning of the 17th century, European infantry was divided into 'Pike and Shot', with partially armoured pikemen protecting unarmoured musketeers. Muskets were still cumbersome at this time and needed a lot of paraphernalia to manage them; and most were so heavy they had to be fired from forked rests. Rates of fire were much slower than the ubiquitous flintlock musket of a century later. Musketeers could shelter under pike blocks while reloading; in turn their fire kept at bay pistol-armed cavalry which might inflict casualties on the pikemen. It did not matter which tactical disposition (Swedish, Dutch or English) a commander favoured, his infantry troops were always of these two types. The proportion of pikemen to musketeers

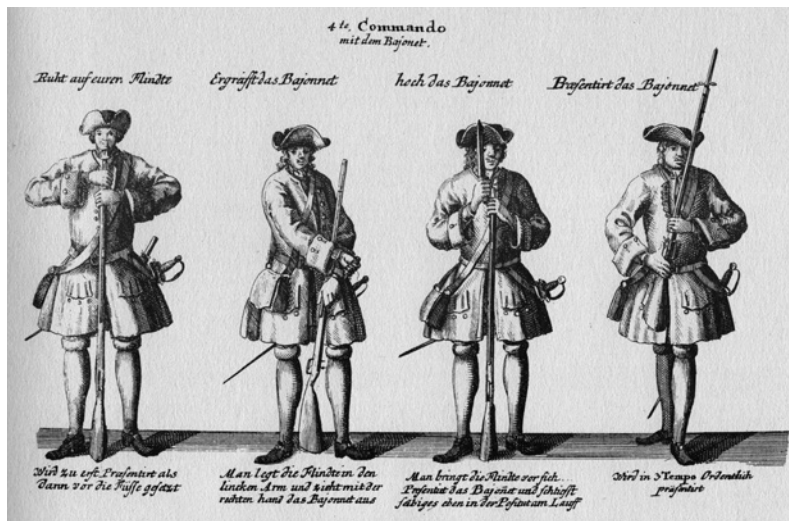


Plate 6 from Johann J. Wolrab's *Military Exercises*, published c.1730, depicts the drill movements for planting a plug bayonet in the muzzle of a musket. Although plug bayonets had largely disappeared by this time, they could still be found in the ranks of less technically advanced armies of smaller states, for example the German duchies and principalities. The left-hand figure shows the plug bayonet carried on the soldier's waist belt – the only instance in the book where the bayonet can be seen being carried. In this case it appears to be worn at the small of the back. (Author's Collection)

varied at any given time, although by the end of the century, muskets greatly outnumbered pikes.

The French appear to have been the first to issue bayonets to some troops. The Jesuit Fr Gabriel Daniel, who was appointed historiographer of France by Louis XIV, noted that the King said that he had first issued the bayonet to the Fusiliers Regiment (subsequently designated the Royal Artillery Regiment) in 1671; the bayonet was carried in a sleeve next to the hanger. Other regiments were subsequently also issued bayonets (Daniel 1721: 2.422).

At the same time in Britain, the issue of bayonets to some troops was still sufficiently unusual for it to be noted in contemporary accounts. In April 1672, Prince Rupert's Regiment of Dragoons was raised, the warrant stipulating that each of its soldiers was to have a matchlock musket, a bandolier and a bayonet or 'greate knife' (Tincey 1994: 14). Thirteen years later, each new troop of Dragoons raised during Monmouth's Rebellion in the West Country of England was to have bayonets with frogs and belts (Tincey 1994: 24). The soldiers in the two grenadier companies of the Foot Guards at James II's coronation on 23 April 1685 each had a cartouche box, a bayonet, a grenade pouch and a 'hammer hatchet' (Tincey 1994: 35). Likewise, the Regulations of 21 February 1687 stipulated that musketeers of the Regiment of Foot Guards were to have snaphaunce (an early form of flintlock) muskets, swords, bandoliers and bayonets (Tincey 1994: 24). The same applied to the Royal Regiment of Fusiliers, all the Foot Grenadiers, the Company of Miners and the Dragoons. It is notable that only a portion of the British Army at the time was issued with plug bayonets, the use of which was confined to specialist troops rather than the line infantry. These troops did not have any pikemen in their units who could protect them from cavalry attacks and were reliant on their bayonets to see off enemy horsemen.

Then, as the numbers of pike-armed infantry dwindled, more and more infantry were furnished with flintlock muskets until, by about 1700, the pike vanished altogether. (Unusually, the Swedish and

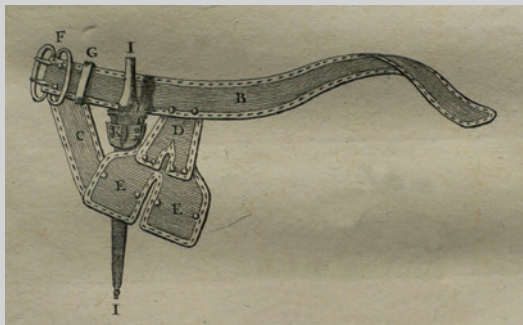
BAYONET CARRIAGE

In the bayonet's earliest days, carriage was by means of a simple sheath with a loop on the rear which went on the soldier's belt. As armies became more standardized and their firearms and equipment assumed a uniform nature, the way that soldiers carried their bayonets changed also. English (and later British) practices offer a good indication of how all European armies carried the bayonet.

During Monmouth's Rebellion in the West Country of England in 1685, '5 New troops of Dragoons' were to be raised; the list of their equipment includes 'Byonettes with Froggs and Belts' (quoted in Tincey 1994: 15). This is the earliest known reference in English which specifies how the Dragoon's bayonet was to be carried. A pen-and-watercolour drawing in the British Royal Collection of Dutch soldiers in King William III's army shows plug bayonets carried in what appear to be loops on their waist belts to the immediate left of the coat-button line. Presumably these are the 'Froggs' referred to earlier. The position for carrying the plug bayonet is confirmed by a painting of Captain Francis Hawley, 1st Foot Guards, whose bayonet is carried in an embroidered cloth frog.

The loop on the waist belt carried over into Marlborough's army of 1702–11. This arrangement served well for both plug and socket bayonets, both of which could be easily accommodated in it. It also put the bayonet conveniently close to the soldier's other close-combat weapon, the hanger (a short sword).

Another solution to bayonet carriage can be seen in Saint-Rémy's *Mémoires d'Artillerie* (first published in 1697). Here the bayonet (very clearly a socket type) is carried in a scabbard in the loop formed by two straps joining the shoulder-strap of a *giberne*-type cartridge pouch. A large pear-shaped gunpowder flask is suspended behind the cartridge pouch and a small priming flask with a vent picker hangs from the right side of the shoulder-strap. This was a very convenient arrangement which



The most common method of carrying a plug bayonet, from *Mémoires d'Artillerie* by Pierre Surirey de Saint-Rémy, published in 1697 (1745 edition). The bayonet scabbard is attached to the soldier's sword belt behind the sword frog. (Author's Collection)

consolidated the soldier's bayonet and ammunition in a single place.

During the first quarter of the 18th century, bayonet carriage changed. The soldier's waist belt was fitted with a large fishtail-shaped carrier which held the sword in its lower tube and the bayonet in the upper one. Ammunition continued to be carried in a large pouch resting on the right hip supported by a broad cross-belt. Certainly, by the time that Bernard Lens III (1682–1740) painted 'The Grenadier's Exercise of the Grenade' in 1735, this arrangement was well established within the British Army.

The Prussian Army of the 18th century apparently kept its bayonets fixed at all times and did not issue a scabbard. The noted authority Anthony Kemp stated that during the War of the Spanish Succession (1701–14), Prussian troops did not fix bayonets unless threatened by cavalry, instead carrying it in a leather sling over the shoulder (Kemp 1980: 30). The source for this assertion is not given, however, and careful study of images of the period does not disclose any evidence of this arrangement. In all probability, the Prussians simply kept the bayonet fixed at all times, and there is a further tantalizing clue which tends to confirm this. The German artist Adolph Menzel (1805–1915) depicts a regimental carpenter or pioneer, accompanied by a handwritten note by the artist in which he observes that the bayonet was carried in a sheath behind the sword (Menzel 2005: 149). Whether this was specific to pioneers or universal within the Prussian infantry is not made clear, although the latter interpretation seems unlikely as not a hint of a bayonet scabbard appears in any of Menzel's other pictures.

Sometimes, bayonets had to be kept fixed out of necessity. A General Order of 2 August 1780 to the Pennsylvania Division of the Continental Army directed that a scarcity of bayonets meant they were ordered to be kept fixed continually and removed only when the weapon was being cleaned (Katcher 1989: 23).

In the British Army, battalion companies officially lost their hangers in 1768, although they had not worn them for several years previously. Having retained them (at least in theory) throughout the American Revolutionary War, British Army grenadier companies lost their hangers in 1784. Consequently, the infantryman's equipment changed again. The waist hanger for the sword and bayonet was discarded and another cross-belt took its place. The bayonet scabbard was secured within a tube in the lower part of the belt. The bayonet belt went over the right shoulder and the pouch belt over the left.

Not all armies dispensed with infantry swords and the combined sword-and-bayonet belt endured. In the French Army before and during the Napoleonic Wars (1803–15), the infantry sabre was restricted to the elite companies alone. Fusiliers (members of the French equivalent of 'battalion' companies) wore

an attachment for the bayonet scabbard on their cartridge-belt straps.

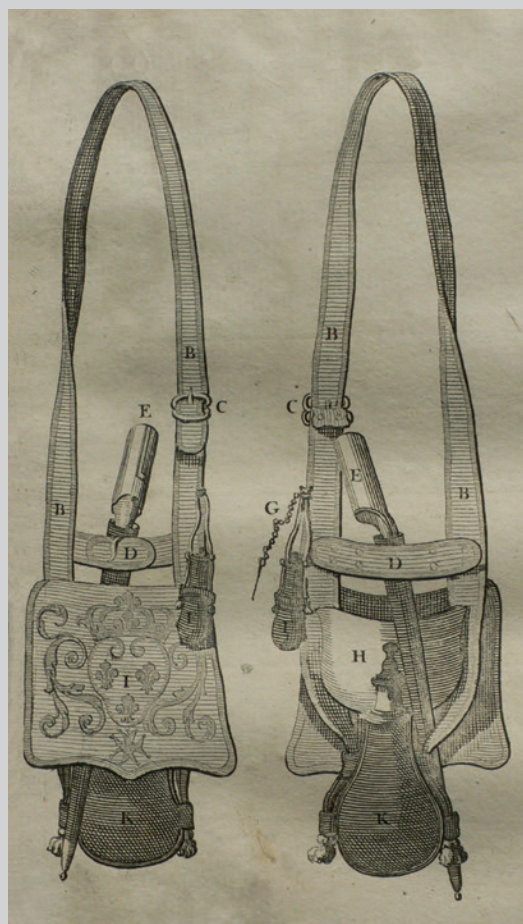
In France, the advent of the Mle 1840 *yataghan* bayonet saw the introduction of a new type of bayonet scabbard. Made of rigid sheet-steel, the scabbard was better able to withstand the rigours of campaigning. Hitherto, bayonet scabbards had been made of leather with sheet-brass or -steel mounts. These were not very durable and prone to damage, especially if inadvertently sat upon by the soldier when the scabbard was empty. The leather creased or tore and often the lower portion became detached. Solid-metal bayonet scabbards were a new departure; but why it took until the 1840s for this to happen is unclear, as all-metal sword scabbards had been in use since the 1790s.

When the British Army's infantry adopted a waist belt for the bayonet on 22 May 1850, the bayonet belt was officially withdrawn from service. The iconic cross-belts that had come to represent the infantry ceased to be worn in other armies at around the same time. The new waist belt had a Y-shaped bayonet frog stitched to it as well as a strap to attach it to the ammunition pouch cross-belt; an arrangement designed to support some of the weight of the ammunition. Sergeants were not issued this belt, instead using a separate frog for their bayonets. Separate frogs were not a new idea as the Royal Artillery had worn them to carry the Dundas Pattern sword or a socket bayonet for garrison duty since the 1840s. This arrangement served until the universal introduction of the separate waist-belt frog in 1871 with the Valise Equipment. For the first time the British soldier could wear his bayonet where he pleased in the most comfortable position to him. By 1850, the sliding waist-belt frog became established as the standard way of carrying a bayonet in most armies, and this is generally the case today.

In the United States, the scabbard incorporated a permanent loop which suspended the bayonet at an angle of about 45 degrees, thus keeping it out of the soldier's way. This concept was elaborated upon by Lieutenant Colonel William Hoffman in what his US patent 2815 (8 May 1860) described as a 'Joint Frog'. Hoffman made the belt loop and the scabbard holder as separate parts and joined them with a brass pin and washers which allowed the parts to swivel, thus giving the soldier absolute flexibility in the angle at which he chose to wear his bayonet. In his patent, Hoffman claimed that his invention prevented wear and tear caused by the swinging of the bayonet in its scabbard; it also held the bayonet close to the body, reducing the risk of the bayonet falling out of its scabbard, and kept it out of the way when the soldier sat down, reducing the risk of accidental breakage. The US Army adopted Hoffman's joint-frog in 1872, giving it a long brass hook for the 1872 waist belt. The swivel incorporated the letters 'US' or a variety of initials for state militias and other organizations.

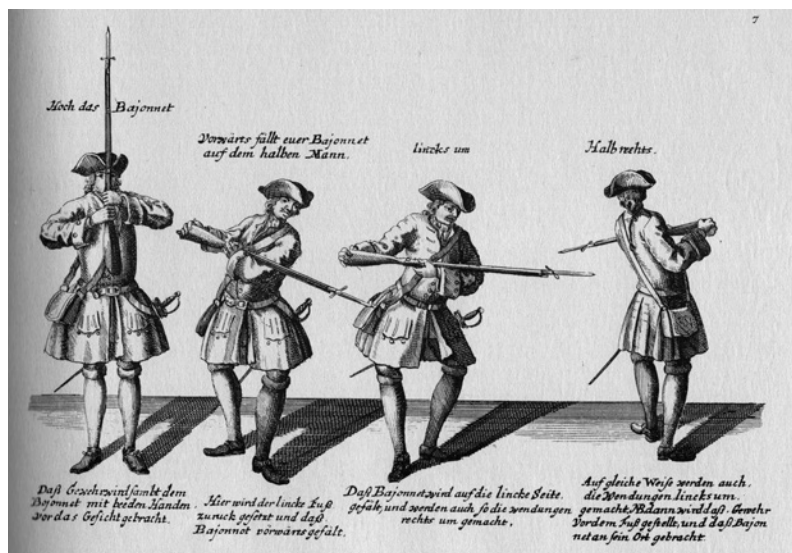
During World War I, US soldiers carried the Model 1905 Springfield sword bayonet on the left side of the backpack. This was convenient and kept the bayonet out of the way. Carriage on equipment rather than in a frog was adopted by the British Army in the 1942 Battle Jerkin, which had slots for both the No. 4 and SMLE bayonets on it. Subsequently, the bayonet was to be carried on the side of the left pouch on both the Pattern 1944 and Pattern 1958 sets of equipment. The bayonet for the SA80 rifle has a quick-detachable combined frog and cover for the scabbard.

Today, many countries have issued special frogs for ceremonial duties. These tend to be made in either buff, white or black patent leather.



An early method of carrying a socket bayonet, from Saint-Rémy. The scabbard is attached to a cross-strop between the two sections of the shoulder-belt of a *giberne*-type cartridge box embellished with the royal arms of France. There is a large pear-shaped flask for loose powder behind the pouch and a small priming flask and vent picker hang from the shoulder-belt. This arrangement provided an integrated carrying system for the soldier's ammunition and bayonet. (Author's Collection)

Plate 7 from Wolrab shows the bayonet in use. The drill positions emphasize the technique of pushing the musket and bayonet forward like a half-pike. (Author's Collection)



Russian armies both retained significant numbers of pikemen during the Great Northern War of 1700–21.) By about 1720, infantrymen of all countries were of similar appearance: really only their coat colours distinguished them from one another because they all carried flintlock muskets and bayonets, and wore no armour. The improved ballistics of the flintlock musket stemming from the use of improved gunpowder hastened the decline of infantry armour, which, if it was of a heavy enough gauge to withstand penetration by a musket ball, was simply too heavy to move in.

The invention of the socket bayonet at the end of the 17th century triggered the demise of the plug bayonet. In the early 18th century, the Abenaki Indians in New France (the territory colonized by the France in North America) were supplied with some obsolete French military equipment which included plug bayonets – a strong indication that the

Plug bayonet versus socket bayonet (opposite)

During the Great Northern War (1700–21), plug bayonets gave way to socket bayonets in most European armies. Here, two Swedish infantrymen armed with flintlock muskets and socket bayonets patrol woodland looking for Russian fugitives after an engagement. In order not to betray their positions to other Swedish troops by noise or smoke, the Russians intend to mount a silent ambush on their pursuers by using the bayonet alone. The man on the right is a grenadier, armed with a flintlock musket and a socket bayonet, while the other Russian is an infantryman: his musket is fitted with a characteristic 'Baltic' lock (an early variant of the flintlock peculiar to that region which was soon superseded by the more robust and efficient 'French' lock or true flintlock). He is in the process of pushing the grip of his distinctive sword/plug bayonet into the bore of his musket. This type of bayonet was only used in Petrine Russia: it had a long single-edged blade and a simple knuckle-bow which allowed it to double as a short sword.



plug bayonet was considered to be so outdated that it might readily be given to allies among the First Nations. It is very unlikely to have been issued to European front-line troops after the end of the Great Northern War in 1721; but it had endured for some 75 years, revolutionized infantry tactics and changed the composition of armies.

THE ARBITER OF BATTLES

While the new socket bayonet conferred massive tactical advantages, the major wars of the early 18th century – the Great Northern War and the War of the Spanish Succession – were fought by armies armed with a mixture of both plug and socket bayonets (Saint-Rémy illustrates both types). By the 1720s, the plug bayonet was all but gone, with the socket bayonet reigning supreme. For the next 150 years the combination of musket or rifle-musket and socket bayonet constituted the infantryman's basic weapon system. This conferred massive flexibility: thus armed, the infantryman had both a missile capability and a close-quarter combat arm for both offensive and defensive use.

The socket bayonet was the infantry shock weapon *par excellence* of the 18th century. Effective musketry – enhanced by being able to load and fire with the bayonet fixed – disordered enemy infantry formations to the extent that they would break and flee in the face of an aggressive bayonet

A sketch of a British grenadier by Lieutenant William Bailie, 1753. Note how the palm of the hand is placed against the musket's buttplate, almost in imitation of the pike drill of 100 years earlier. This stance was intended for use in a disciplined mass formation, rather than amid an unregulated mêlée. It allowed the soldiers of the front rank to protect the middle and centre ranks while they loaded and fired. (Anne S.K. Brown Military Collection, Brown University Library)





SWORD BAYONETS IN SERVICE

It is clear that the rifle was only intended to be fired with its bayonet fixed in an emergency. In 1799, a book entitled *Loyal Volunteers of London & Environs* was published. One of the units depicted, the London and Westminster Light Horse Volunteers, had its 7th, 8th and 9th troops dismounted and armed with rifles and swords that could be used as bayonets (Blackmore 1961: 116). In his *Recollections*, Rifleman Benjamin Harris implies that sword bayonets were fixed just before coming to close quarters with the enemy (Harris 1848: 17).

The problems associated with firing a rifle with its bayonet fixed are borne out by tests conducted in 1836 by George Lovell at the Royal Small Arms Factory Enfield. He fired 85 Baker rifles with fixed bayonets and concluded that they could not be fired safely because

A sword bayonet for the British .625 Baker rifle, c.1810.
(© Royal Armouries X.132)

the blast of propellant gases emerging from the muzzle damaged the crossguard and grip of the bayonet (Blackmore 1961: 120). This seems to refer to the blast of propellant gases at the muzzle; doubtless it was aggravated by adverse barrel harmonics, too.

In reality, the British rifleman probably used his sword more as a handy tool around camp than ever he did as a weapon. Rifleman Harris recounts that he used his bayonet to slit the lining of the clothes of a French corpse in order to get at the dead man's concealed purse. He also employed his bayonet for even more macabre work – scraping blood off dropped biscuits before eating them (Harris 1848: 41).



A soldier of Sadler's Sharp Shooters, from Ackermann 1799. He is armed with 'Sadler's Patent Gun' (probably a rifled carbine) and a long-bladed cutting bayonet. (Author's Collection)



The author with a Wanzl-converted 13.4mm M1854 Lorenz *Jägerstutzen* rifle with its massive *Haubajonett* ('hewing bayonet') fixed. (Chantel Taylor)



The same posture as the one shown in the illustration on page 36, here demonstrated by a soldier of the St James Westminster Loyal Volunteer Regiment, March 1794. Although the musket and bayonet were held slightly higher, little had changed in 41 years; the emphasis was still on defence. (Anne S.K. Brown Military Collection, Brown University Library)

OPPOSITE

A Swiss grenadier of 1792 holds his musket and bayonet in a slight variation of this drill posture, which involves the musket being gripped by the stock wrist and rotated to bring the bayonet blade uppermost. (Anne S.K. Brown Military Collection, Brown University Library)

charge. Resolute infantry armed with bayonets in square formation could repulse a cavalry attack, rendering that arm much less useful to a commander.

The period c.1700–c.1850 saw the all-but-universal issue of the bayonet to infantry and many other troop types of European and other comparable armies. During this era, aggressive use of the bayonet against troops who had been outmanoeuvred and then severely disordered by high volumes of effective musketry often decided the outcome of a battle. Even so, it could only be effective in relatively close engagements, where the attackers only had to cover short distances and where the defenders could not deploy the volume of small-arms fire needed to halt the attack.

The military doctrine of Frederick II of Prussia was built around the bayonet. He advocated careful study and familiarity with the ground followed by rapidity of manoeuvre to get his troops into a position that allowed them to dominate the enemy. Once there, the rapidity and effective application of high volumes of musketry both disordered and demoralized the enemy ranks. Once the infantry firefight had been won, the ravaged enemy was charged with the bayonet, causing him to flee the field in most instances. Frederick also urged his troops to use the bayonet against emplaced troops, notably at the battle of Leuthen on 5 December 1757 during the Seven Years' War (1756–63).



A MISPLACED ARTICLE OF FAITH?

The mass issue of rifled firearms in the years after 1850, and the consequent effects on the infantryman's range and the volume and effectiveness of his fire, meant that the bayonet could not be used in the same fashion as it had been for generations. Even so, the persistent and slavish reliance on bayonet attacks in an era when the effective range and volume of fire from infantry small arms, machine guns and efficient artillery were increasing at pace led to disastrously high casualty levels. Military technology evolved at breakneck speed whereas tactics remained stagnant.

The traditionally aggressive approach to the offensive use of the bayonet held good for the first half of the 19th century because the distance of attack was short, and the enemy had a limited opportunity to fire on their attackers due to the slowness of reloading the smoothbore musket. Thereafter, emplaced troops armed with rifle-muskets could inflict heavy casualties on attacking infantry, as demonstrated by the lethal effectiveness of the Confederate forces' defensive fire on Marye's Heights during the battle of Fredericksburg (December 11–15, 1862). In similar circumstances, Union troops inflicted devastating casualties on Pickett's Division at the battle of Gettysburg (July 1–3, 1863).

Breech-loading artillery and repeating rifles had even greater effective ranges than their muzzle-loading predecessors, which meant that attacking infantry had to cover much greater distances while exposed to heavier volumes of more accurate fire. At the battle of Gravelotte–Saint-Privat on 18 August 1870 during the Franco-Prussian War (1870–71), for example, Prussian and Hessian troops sustained heavy casualties from the long-range fire of Chassepot rifles, supported by that of *mitrailleuses* (early machine guns). The French failed to mount a counter-attack on their weakened opponents, however, thereby allowing a further attack by the Prussian Guards – heavily supported by the new Krupp artillery – which eventually succeeded, albeit after sustaining serious casualties. All told, the Prussians and Hessians lost over 20,000 men killed, wounded or missing in action, while French losses were some 12,000.

By the mid-1890s, the armies of all the major powers possessed gas-operated machine guns, quick-firing artillery and small-bore magazine rifles. That alone should have persuaded commanders that bayonet attacks over long approaches against emplaced enemies were doomed to failure. In the event it did not; and commanders still sent wave after wave of troops to certain failure with unsustainable casualty levels. During the Russo-Japanese War (1904–05), the continued Japanese assaults on 203 Metre Hill that were part of the siege of Port Arthur (1 August 1904–2 January 1905) cost the attackers 8,000 dead and wounded in the final assault alone. Though the assault was judged to have been successful, it was something of a Pyrrhic victory.

This deluded belief in the invincibility of the bayonet charge was the weapon's greatest negative impact. Successful charges – launched over short distances – during the 18th and early 19th centuries convinced later commanders that charges over longer distances and in the face of much more powerful and accurate weapons would still work. The bayonet had



A rare photograph of two Württemberg infantrymen in full marching order taken during the Austro-Prussian War (1866). They are armed with 13.9mm M1857 rifle-muskets with fixed socket bayonets. As well as their bayonets, both soldiers carry broad-bladed short swords for close-quarter fighting. In reality, these were probably more useful as handy tools around camp for cutting wood, roasting meat, etc. Their scabbards appear to have a short base section and top strap to accommodate the bayonet. (Anne S.K. Brown Military Collection, Brown University Library)

engendered a sort of victory 'disease'. When infected by this, commanders no longer cared about the disastrous toll in casualties that these long-range assaults invariably engendered among the attacking troops, for the mere act of closing with the bayonet would carry the day by making the enemy flee.

The major powers of Europe were still obsessed with the 'reach' of a bayonet on a rifle at the beginning of the 20th century. France, Germany and Russia all had exceptionally long rifle/bayonet combinations which were clearly intended to see off any cavalryman rash enough to engage enemy infantry with sabre or lance. The German Army officer





Bayonet clash, American Civil War (previous pages)

When the American Civil War broke out in April 1861, both sides were desperately short of arms of all kinds. Consequently, many obsolete European bayonets and rifles appeared in the arsenals of both sides. Here, a dismounted Union cavalryman armed with a long-obsolete .64 Model 1833 Hall carbine vainly tries to defend himself against the onslaught of a Confederate soldier armed with a .54 Model 1841 'Mississippi' rifle fitted with an M1855 *yataghan* bayonet. The Confederate uses the weight and cutting edge of his *yataghan* bayonet to effortlessly shatter the M1833's flimsy rod bayonet.

Nearby, a second Confederate armed with a .577 Pattern 1853 Enfield rifle-musket fitted with a conventional socket bayonet defends himself against the lunge of his Union adversary's leviathan Austro-Hungarian M1854 *Haubajonett* ('hewing bayonet') fixed on a 13.9mm M1854 Lorenz rifle. This bayonet was designed to be used both as a thrusting weapon and also as a type of glaive with a cutting action.

Oberstleutnant William Balck – later a divisional commander in World War I – confirmed this in his six-volume work, *Taktik*, published in German in 1903 and subsequently translated into English:

The individual infantryman whose rifle is loaded and who knows how to use his bayonet is more than a match for the individual mounted man even on open ground; and if he remains cool, retains his presence of mind, and uses his rifle properly while keeping his opponent constantly in view, he is even superior to several mounted men. Infantry which retains its steadiness has nothing to fear even when outnumbered by cavalry. Its main strength lies in steadily delivered fire, while cavalry relies on the possibility of making an unexpected rapid charge, on quickly covering great distances, and on the moral effect which its irresistible onslaught undoubtedly produces upon infantry. (Balck 1915: 301)

US Model 1873 Springfield 'trapdoor' socket bayonet. Its sheet-steel scabbard incorporates a Hoffman-type swivel and a brass hook for use in conjunction with the waist belt. The blade is 18.0in long. (Chantel Taylor)

Like other commentators, Balck saw the bayonet and its use as a vital part of promoting and sustaining the infantryman's morale:



BAYONET KNOTS (*TRODDELN*)

The sword knot or *Portepe* was originally designed to link the sword to the soldier's wrist to ensure it would not be lost if inadvertently dropped or knocked out of his hand. The bayonet knot or *Troddel* was a stylized version of the *Portepe*, the main difference being that the *Troddel* (from the German word for 'tassel') has a fringe whereas the *Portepe* culminates in a bulb.

During the 18th century, Prussian infantry carried short hangers which had woollen sword knots wrapped around their hilts. After infantry swords were abandoned by the Prussians in the years after the Napoleonic Wars, the knot was retained and later applied to the bayonet where it was wrapped around the strap of the frog. It served no practical function, but its colours delineated the company to which its wearer belonged. (This was based on a three-battalion regiment, each with four companies. The addition of machine-gun and supply companies in the early 20th century complicated matters.)

The *Troddel* was composed of five elements: the band, the tassel (these first two were always white), the slider, the wreath and the stalk. Each of the latter three could have a different colour – white, red, yellow or blue. Depending on the colour combination, the wearer's company could be determined. For example, a soldier whose *Troddel* was all white belonged to the 1st Company and was in the 1st Battalion. A soldier with a *Troddel* with a yellow slider, a red stalk and a yellow wreath belonged to the 7th Company in the 2nd Battalion. *Jäger* battalions wore all-green *Troddeln*. In the German Empire after 1871, soldiers ranking above *Gefreiter* (corporal) wore *Troddeln* with stripes and threads in the colour of the state to which the regiment belonged, variants including black (Prussia), light blue (Bavaria), green (Saxony) and red (Hesse), among others.

During World War I, pressure on raw materials meant that grey-coloured cotton waste was used for the band and tassel threads, giving the *Troddel* a much duller aspect. *Troddeln* were worn after World War I during the Weimar Republic and the Third Reich but their form became much more like a sword knot, with no loose tassel threads.

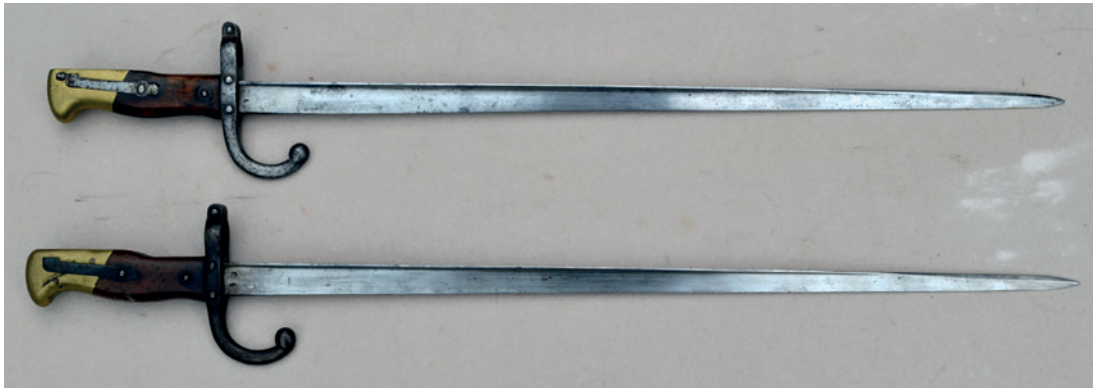
Original *Troddeln* are extremely rare, and so the use of reproductions is considered to be quite acceptable in a display. A reproduction *Troddel* enhances the appearance of any Imperial German bayonet and frog. The collector needs to be alert for fakes, however, as replicas can easily be given an aged appearance by dyeing in strong tea.

Austro-Hungarian Army NCOs wore yellow-and-black-striped *Troddeln* on their bayonets. These were a distinct variant of the standard bayonet, featuring a small loop on the pommel and a sharply recurved quillon. The *Troddel* was suspended from the loop and wrapped around the quillon. From 1916, Austro-Hungarian Army officers routinely wore bayonets to replace the swords that

many had abandoned in the early months of World War I. (In September 1914, the Archduke Frederick, the Supreme Commander of the Austro-Hungarian Army, had circulated a letter advising officers to shed all items – swords, leather belts, sashes, etc. – that might make them an attractive target to enemy marksmen.) The officer's bayonet was worn with a *Portepe* made of black-striped-gold thread.



This 1915-dated German S 98/05 'butcher knife' bayonet with partial muzzle ring is shown in its original scabbard and leather frog. The frog strap is wrapped with an ultra-rare *ersatz* (replacement) *Troddel*, denoting the wearer was in 5. Kompagnie, II. Battalion. The blade is 14.5in long. (Chantel Taylor)



Two French Mle 1874 Gras sword bayonets. The upper example has been commercially modified to fit one of the surplus German 8mm M1888 rifles supplied to the Ulster Volunteer Force in 1914 by Bruno Spiro of the Hamburg arms dealer firm, Benny Spiro. The brass pommel has been ground down and the locking catch modified. Blade length is 20.5in. (Chantel Taylor)

In time of peace there should be instilled in the soldier the conviction that, with the bayonet, he is a match for any opponent; that in bayonet fighting, no other infantry is the equal of his own. The soldier should not be taught to shrink from the bayonet attack, but to seek it. If the infantry is deprived of the *arme blanche* ['white arms', i.e. close-combat weapons such as the bayonet], if the impossibility of bayonet fighting is preached, and the soldier is never given an opportunity in time of peace of defending himself, man to man, with his weapon in bayonet fencing, an infantry will be developed, which is unsuitable for attack and which, moreover, lacks a most essential quality, viz., the moral power to reach the enemy's position. (Balck 1915: 383)

Balck goes on to quote the Russian general and military thinker Mikhail I. Dragomirov:

Below is a sword bayonet for the 10.35mm M1870/87 Vetterli-Vitali rifle (the blade is 20.4in long). Above it is an officially shortened version (9.25in blade), converted during World War I for the 6.5mm M1870/87/15 Vetterli-Vitali-Carcano rifle. (Chantel Taylor)

The rarity of bayonet fights does not prove the uselessness of the bayonet but shows that opponents will rarely be found who are equally capable of making use of it. Indeed, the bayonet cannot be abolished for the reason, if for no other, that it is the sole and exclusive embodiment of that will power which alone, both in war and in everyday life, attains its object, whereas reason only tends to facilitate the attainment of the object.



SAW-BACKED BAYONETS IN SERVICE

The use of saw-backed bayonets by German troops during World War I has led to the myth that Allied troops summarily executed any captured German soldier carrying one, in the mistaken belief that the saw teeth caused terrible wounds. No evidence exists to sustain this notion. Ironically, the reality is that saw teeth make a bayonet not only less effective as a penetrator, but also much more difficult to withdraw as they get caught in a wound. Consequently, such bayonets are less effective than a simple blade.

Certainly, German troops did not regard the carriage of saw-backed bayonets as contravening the Geneva Convention of 1864 by being a weapon intended to cause 'unnecessary suffering'. A directive from the Prussian War Ministry dated 23 January 1917 stated that it considered saw-backed bayonets vital for manoeuvre warfare and that their use should continue (Walter 1976: 67). Late in 1917, Germany withdrew saw-backed bayonets from infantry regiments, not because of worries of ill-treatment of German prisoners by the Allies but because they were no longer effective against Allied barbed-wire pickets, which had been changed from wood to iron the previous year. Once the withdrawn bayonets were in store, their saw teeth were ground off and the bayonets re-issued. Many German bayonets of all models can be found today with their saw teeth removed, the quality of the work dependent on where this process took place. Crudely modified examples were probably the work of unit armourers, while more refined finishes suggest that the modification was carried out at a depot or factory equipped with superior machinery.

Perhaps the belief that Allied troops summarily executed any Germans they caught with saw-backed bayonets comes from the 1929 novel *Im Westen nichts Neues* by Erich Maria Remarque, published in English as *All Quiet on the Western Front*. Remarque states that if German soldiers carrying saw-backed bayonets were caught by the enemy, they were likely to be killed out of hand; he reports that German corpses were found mutilated, having had their noses severed and their eyes poked out with their own bayonets. Given that Remarque saw active service in the trenches himself, it may be that he heard comrades tell of these appalling retributions. Alternatively, he may have repeated these rumours to give colour and background to his novel. Given that the book was translated into many languages and sold 2.5 million copies in its first 18 months, Remarque's account seems to be the most likely source of this myth.

Whether the saw function of the bayonet was ever effective is a moot point. Reconstructive work on scrap wood by the author found that the saw-backed bayonet was uncomfortable and awkward to use as a saw after just a few strokes, although it was functionally effective. The ultimate conclusion drawn was that while the saw-backed bayonet was better than nothing, a purpose-built hand saw would have been much easier to use and more effective. However,

perhaps the ready availability of the saw on the bayonet made up for the inconvenience caused by having to carry another piece of equipment.



The S 98/05, depicted here with its scabbard and frog, was widely used by German forces during World War I. The blade is 14.5in long. (© Royal Armouries PR.2836)



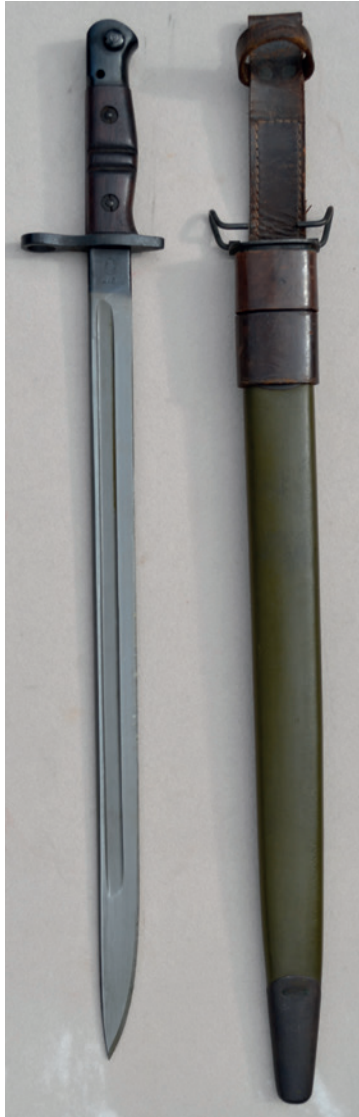
British sailors armed with .577/450 Martini-Henry rifles and Pattern 1887 sword bayonets form a rallying point during landing drills, c.1896. Although the Martini-Henry had been superseded by the .303 Lee-Enfield rifle by then, many were issued to the Royal Navy, the Militia and Commonwealth troops. (The Print Collector/Print Collector/Getty Images)

Let us assume that there exists an army which bases success in battle on fire, action and takes for granted that the enemy will not be able to get near enough to make a bayonet attack. If this army were to encounter another army which, without undervaluing the effect of fire, remembers the bayonet at the proper time, it would be filled with the most dreadful dismay when the enemy actually assaults it with the bayonet. With modern rifles, bullets are unquestionably a good substitute for the bayonet at close quarters, but this is true only of troops who do not fear annihilation, i.e. troops trained to use the bayonet and capable of closing with the enemy after firing. (Quoted in Balck 1915: 383–84)

Major-General Ivor Maxse, GOC 18th (Eastern) Division during the battle of the Somme (July–November 1916), actually built a huge

Knife bayonet (above; blade length 8.25in) and sword bayonet (below; blade length 16in) for the 7mm Model 1896/1902 Remington rolling-block rifle. The black walnut grip is marked 'US ORD DEPT NAVY YARD' (designation illegible). The significance of this mark is unknown as this rifle was never officially adopted by the US Government. The steel-mounted black leather scabbard is fitted with a swivelling steel belt loop. (Chantel Taylor)





FAR LEFT

This S 84/98 knife bayonet has been converted for the 7.92mm Mauser Gew 98 rifle by re-hilting an S 71/84 bayonet. The blade is 9.8in long. (Chantel Taylor)

LEFT

This US Model 1917 rifle sword bayonet with 17in blade was made by Remington in 1920. It is shown in its green leather scabbard with a wire clip for the eyelet in the Model 1917 cartridge belt. It also has a British Pattern 1939 Emergency Equipment leather frog, indicating issue to the British Home Guard during World War II. Note the two broad grooves on the grips: these indicated that this bayonet could not be fitted to the .303 SMLE rifle. (Chantel Taylor)

component of failure into his tactical thinking on bayonet attacks, commenting that while one, two or even three lines of troops risked failure in the assault, deploying four lines usually brought success (Ripley 1999: 23). It is staggering to think that any general officer should have been prepared to keep throwing four waves of men against an emplaced enemy and only expecting the fourth to take the position. Such a philosophy had heavy casualties built into it as a major component.

In the *Bayonet Training Manual used by British Forces*, published in May 1917 for the benefit of US troops preparing for deployment to Europe, the following quotation espouses a similar philosophy:

The bayonet is essentially an offensive weapon – go straight at an opponent with the point threatening his throat and deliver a thrust





OPPOSITE TOP

Two soldiers from The Staffordshire Regiment compare bayonets in a troop trial, c.1938. The corporal on the right has a Pattern 1907 sword bayonet on his .303 SMLE rifle and wears the Pattern 1908 webbing equipment. His comrade has the more modern Pattern 1937 equipment and holds an experimental shortened and lightened Pattern 1907 bayonet. (Keystone-France/Gamma-Keystone via Getty Images)

OPPOSITE BOTTOM

These Red Army soldiers are armed with 7.62mm Mosin-Nagant M1891/30 rifles and socket bayonets, c.1939. Soviet tactical doctrine required that the bayonet be fixed at all times, so no bayonet scabbard was issued with it. (Max Penson/Getty Images)

Forest ambush, 1914 (previous pages)

Two German soldiers – an infantryman and a pioneer – are surprised by a French patrol during the early weeks of World War I. The pioneer is using the saw-toothed back of his Mauser S 98/05 bayonet to cut a tree branch. The infantryman is armed with a Mauser S 98 bayonet with its distinctive, long quill-backed blade, specifically adopted to put the German soldier on an equal footing as regards ‘reach’ with the French, who had adopted a bayonet of similar dimensions with the Lebel rifle in 1886.

The three French soldiers are armed with 8mm Mle 1886/M93 Lebel rifles fitted with the distinctive white-metal-hilted Mle 1886 bayonet. Known as ‘la Rosalie’ to French troops, this bayonet epitomized the dashing élan of the French soldier. Sadly, this misplaced faith in the invincibility of bayonet charges caused French casualty rates to rocket when launched against emplaced troops protected by machine guns and barbed-wire entanglements.

wherever an opening presents itself. If no opening is obvious, then create one by beating off the opponent’s weapon or making a ‘feint thrust’ in order to make him uncover himself ... *In a bayonet assault, all ranks will go forward to kill or be killed, and only those who have developed skill and strength by constant training will be able to kill.* The spirit of the bayonet must be inculcated into all ranks, so that they go forward with the aggressive determination and confidence of superiority born of continued practice, without which a bayonet charge will not be effective. (US Infantry Association 1917: 1–2)

On a battlefield that was constantly raked with lethal projectiles of all kinds, the inverse of this philosophy was true: the bayonet was actually best seen as a defensive weapon to be used as a matter of last resort when all other means had been exhausted. As World War I progressed, the realization that the bayonet had serious limitations on a modern, static battlefield began to dawn on commanders, albeit slowly. When actually fighting in the confines of a trench, the long rifle/bayonet combination proved to be a serious handicap. Instead, troops turned to daggers – both improvised and officially issued – as well as clubs and sharpened spades for hand-to-hand fighting. As a consequence of this change, the bayonet’s impact declined dramatically over the course of the war.

A USEFUL ADJUNCT

After World War I, the development of fire-and-manoeuve tactics within fully integrated all-arms warfare relegated the bayonet to an occasionally useful weapon which, if used with resolution, might decide the outcome of an engagement in an emergency. The decline in the bayonet’s perceived importance continued during World War II. In most armies during the latter conflict, the bayonet was used in a more



PREVENTION OF LOSS

While the main emphasis of bayonet design was applied towards securing it tightly on a firearm's muzzle, some effort was directed towards ensuring that it could not be accidentally separated from its scabbard.

Manoeuvres in the field always brought the possibility that a bayonet might fall out of its scabbard and be lost. This was particularly so with the advent of breech-loading rifles, the use of which led to soldiers being encouraged to operate as individuals and take advantage of the cover that a prone position afforded. Crawling around the countryside increased the chances that equipment – and not just bayonets – might be lost. Hitherto, with the characteristic large linear formations involving standing men, the likelihood was that any bayonet which fell out of its scabbard would be noticed by another soldier and returned to its owner. Consequently, early metal-tipped leather scabbards were not fitted with any device to retain the bayonet in them.

It was the advent of sheet-steel scabbards from around 1840 that introduced the routine fitting of retaining devices to prevent the accidental loss of a bayonet. In the main, this took the form of a throat liner with two sprung steel 'ears' which gripped the blade, holding it firmly in place. Additionally, some countries' belt frogs incorporated a loop or strap higher up to secure the bayonet further, particularly when being worn by mounted troops. In the case of the British Pattern 1937 and Pattern 1944 webbing frogs, the addition of the pommel loop was universal.

During the late 1850s, as the Royal Navy was seeking to adopt a cutlass bayonet for those rifles intended for shipboard use, Lieutenant Edward H. Verney RN proposed a spring catch to keep the cutlass securely in its scabbard when not in use. This was officially adopted in 1861 and recorded in Paragraph 369 of *The List of Changes in British War Material* (LoC) for 19 September 1861. As few examples are known, however, Verney's spring catch does not appear to have been manufactured. In any case, another catch designed by Colonel William M. Dixon RA, Superintendent at the Royal Small Arms Factory Enfield, superseded Verney's spring catch and was included in the LoC (Paragraph 504, 30 January 1862). No reason is given for this; however, the Ordnance probably felt less liable to be charged royalty payments as Dixon was a government employee. In any case, the matter is academic as neither cutlasses nor cutlass bayonets were manufactured with any retaining catches.

In 1882, the German cutlery firm Alexander Coppel of Solingen was granted British Provisional Patent 5684 of 29 November for 'Appliances for fixing swords and other sidearms in the Sheath'. (Alexander O. Coppel's patent was filed in the name of his British agent, Peter Jensen). The specification notes that although bayonet sheaths featured two springs that were intended to hold the bayonet blade in place by friction, these springs could wear out unless they were so hard as to damage the blade; moreover, troops on horseback or running on foot could find that their bayonets worked loose and they were thus hindered in their movements



British Pattern 1840 Constabulary socket bayonet with its original brass-mounted leather scabbard. The bayonet is fitted with a collar for George Lovell's spring catch of 1844, together with a spring on the face of the blade to prevent it being drawn by a rioter and turned on a constable. Extant scabbards of this period are very rare. The blade is 13.6in long. (Chantel Taylor)



Dating from 1944, this German S 84/98 III (3rd Model) knife bayonet for the 7.92mm Mauser Kar 98k rifle is shown with its original scabbard and cavalry-pattern leather frog with hilt-retaining strap. The blade is 9.8in long. (Chantel Taylor)

(Evans 1991: 138). The remedy came in the form of a small spring catch mounted in a square-section housing on the left side of the scabbard locket. This catch engaged with a lip on the bayonet's hilt to secure it in the scabbard, and required a positive pulling action to release it. As the patent was only provisional, no drawing was attached to the specification. However, Danish M.1889, M.1889-93 and M.1915 bayonets for 8mm Krag-Jørgensen rifles were all made with the Coppel patent 1882 catch. Unsurprisingly, Denmark's neighbour Norway also used the Coppel scabbard catch on its Krag-Jørgensen bayonets.

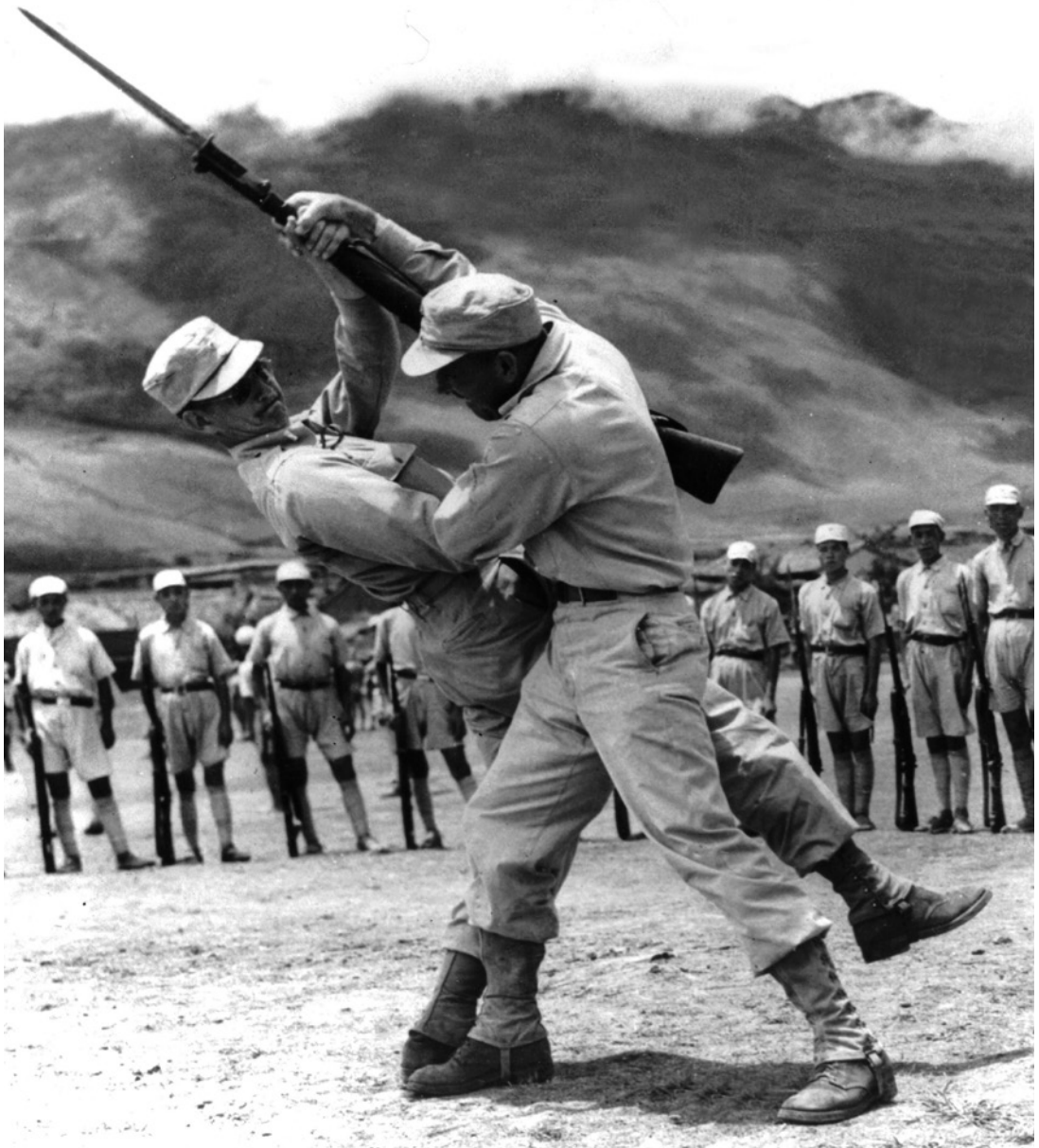
In 1902, the Imperial Japanese Navy adopted its own specific rifle, the 6.5mm Type 35 Arisaka. This had a specially modified version of the standard Type 30 sword bayonet. The back of the hilt incorporated a small one-piece spring catch which projected through the crossguard to engage with a special piece mounted on the scabbard throat. This secured the bayonet in its scabbard. Presumably it was thought that the loss of a bayonet by a sailor had more serious consequences, given the routine proximity to the sea. The Type 35 rifle was soon superseded by the 6.5mm Type 38 Arisaka and the special bayonet appears to have been discontinued with it. Specimens are rarely encountered today.

The 4 January 1905 letter of intervention written by President Theodore Roosevelt to Secretary of War William H. Taft concerning the design of US bayonets saw the introduction of the Model 1905

Springfield sword bayonet, which ousted the rod bayonet on the new Model 1903 Springfield rifle. The Model 1905 bayonet had a similar spring catch to the Japanese Type 35. Originally, it engaged with small hooks on the scabbard throat, but this arrangement proved defective. In 1907–08 the design was modified, following reports of defects from the Philippines; as a result of an investigation, a new catch was designed and more than 150,000 bayonets in store were altered (Hardin 1977: 160). The concept of this catch lasted in the United States until the 1950s with the M1 bayonet for the .30-06 M1 Garand rifle.

For law-enforcement use, the British developed a socket bayonet for the Pattern 1840 Constabulary carbine. This bayonet had a large spring catch on the flat face of the blade immediately below the shoulder. This catch engaged a notch in the scabbard locket in order to prevent the bayonet being drawn and turned on the constable by a malefactor during the close proximity of an arrest or when restraining a turbulent crowd. The bayonet could only be withdrawn from its scabbard by the deliberate application of pressure on the spring catch, which allowed it to be pulled clear. The possibility of it being snatched out of the scabbard and used against its owner was obviated by this device.

With the exception of these examples, bayonets were kept securely in their scabbards by no other means than the pair of spring steel 'ears' in the scabbard's throat.



China, 1944: US instructors from General Joseph W. Stilwell's 'Y Force' demonstrate how to disarm an enemy armed with a rifle and bayonet. The rifle is a 7.92mm Mauser Standardmodell (identical to the Wehrmacht's Kar 98k), fitted with an FN M1924 bayonet. (Photo12/UiG/Getty Images)

appropriate manner, as a weapon to be used at sub-unit level in short-range charges to drive off the enemy or winkle him out of his position. The exception to this was Imperial Japan, which continued to espouse the use of 'cold steel'. The Japanese military psyche was heavily influenced by the code of Bushido, in which the bayonet became a substitute for the *katana* sword of the Samurai. This approach, combined with the deep-seated belief that it was an honour to die in the Emperor's service, gave the bayonet charge supreme tactical importance to the Japanese. This worked effectively when the enemy was an inefficient, demoralized and badly equipped army. When the Japanese came up against resolute US troops, however, well dug in and



armed with semi-automatic rifles, very heavy casualties among the attackers were inevitable.

BAYONETS AFTER 1945

Since World War II, the bayonet has proved to be no more than a handy multi-purpose tool that can be used as a weapon when all else has failed. There have been bayonet charges in recent years, but these were generally mounted by individuals in specific, desperate circumstances rather than being part of an overall plan devised by a unit or sub-unit commander. These instances are so unusual that they are invariably given prominence when reported by the media.

Probably the last sub-unit-scale attack by the British Army was mounted by the Scots Guards on Mount Tumbledown in the Falkland Islands in 1982. During the operation to re-take the Falkland Islands from Argentina, British forces recognized the strategic importance of

Three 20th-century British bayonets. Above is the No. 5 bayonet for the .303 Lee-Enfield No. 5 Mk I 'Jungle Carbine' (8in blade); in the centre, a No. 9 bayonet for the .303 Lee-Enfield No. 4 rifle (also 8in blade); and below, an L1A3 bayonet for the 7.62mm L1A1 Self-Loading Rifle (7.8in blade). (Chantel Taylor)

British L1A2 wire-cutter bayonet for the 5.56mm SA80 rifle. The blade fits to the scabbard for wire-cutting with the wood saw deployed. (© Royal Armouries XXII.184)



Mount Tumbledown because it overlooked the islands' capital, Port Stanley. Mount Tumbledown was held by a mixed Argentine force some six platoons strong. Originally, the attack was planned as a daylight operation but was rescheduled as a night attack because it was considered that any approach to the Argentine positions in daylight would have been suicidal.

The attack began at 2100hrs on 13 June 1982 and soon started to falter in the teeth of heavy Argentine defensive fire. The British left flank, composed of troops from 2nd Battalion Scots Guards under Major John P. Kiszely, encountered particularly stiff resistance and the attack bogged down. At 0230hrs on 14 June, 14 and 15 platoons launched a bayonet attack to try to regain momentum and bayonet fighting ensued on the summit. Major Kiszely bayoneted two Argentinians and broke his bayonet on a third. The attack overwhelmed the Argentine positions and drove them off the strategic high ground. Standing among the rocks on the summit, the attackers could see the lights of Port Stanley below.

A burst of machine-gun fire from an Argentine counter-attack wounded Lieutenant Alasdair M. Mitchell, 15 Platoon commander, and two other guardsmen, as well as injuring Major Kiszely. For his part in initiating the bayonet attack, Major Kiszely was awarded the Military Cross.

IMPACT

The bayonet's reach

For a weapon that was developed from an act of improvisation likely driven by sheer desperation, the bayonet had a huge and long-lasting impact on land warfare.

A SPUR TO INNOVATION

As we have seen, the advent of the bayonet changed the composition of armies. From about 1600, European armies had two distinct types of infantry: pike and shot. The former were missile troops while the latter were close-quarter fighters whether defending the former while they reloaded, or as shock troops in the assault. By 1720 that distinction had been abolished, with every infantryman now a combination of both.

The bayonet's most important impact across the years since its widespread adoption was to provide the infantryman with the means to

Pritchard Patent revolver bayonet, c.1917. Invented by Lieutenant Arthur Pritchard of The Princess Charlotte of Wales's (Royal Berkshire Regiment), this bayonet was protected by British Patent No. 111526 of 1916. It fitted onto a standard .455 Webley Mk VI service revolver and was designed for trench raiding. This was not an official-issue bayonet but a private-purchase item made by the Birmingham gunmaker, W.W. Greener Ltd. The blade and scabbard were made from cut-down French Mle 1874 Gras bayonets. (© Royal Armouries XII.3986)





September 1917: a sergeant of The East Lancashire Regiment observes enemy trenches with a trench mirror fitted to the Pattern 1907 sword bayonet on his .303 SMLE rifle, somewhere in France or Flanders. (Mondadori via Getty Images)

fulfil his primary function – to take and hold ground. The costliness of launching a bayonet attack over long distances of open ground may have had some effect in encouraging the provision of an individual entrenching tool to every infantryman from about 1875 onwards. It was, however, nowhere near as important a factor as the development of the small-calibre repeating rifle firing a smokeless cartridge. The weight, rapidity and accuracy of fire over relatively long distances meant that the only sensible option was to get down, throw up hasty protection and return fire while another unit tried to turn the enemy's flank. The bayonet's tactical importance declined as fire-and-manoevre tactics became more effective.

BAYONETS AND MORALE

It can be safely concluded that the bayonet's real impact was as a psychological weapon, the threat of which had a far greater effect than ever its actual use did.

The psychology of the bayonet is uncomplicated and is predicated upon two basic effects. The first is to intimidate the enemy and make any resistance he may offer less effective. The natural extension of this effect is that ultimately, he might decide that fight is no longer an option and choose flight instead. A fleeing enemy yields ground which can then be occupied and held. A fleeing enemy can also be harried by cavalry and

HARMONICS AND MOUNTING BARS

When a rifle is fired, the force of the explosion creates minuscule vibrations which cause the rifle's barrel to flex very slightly, a phenomenon known as 'barrel harmonics'. Consistent accuracy is enhanced by ensuring that barrel harmonics are as near as they can be to being identical for every shot. Hunting and target rifles achieve this by various means – with muzzle brakes, thicker/shorter barrels, vibration tuners, barrel bedding and increased precision in the manufacture of ammunition. For all that they had some effect on a military rifle's performance, barrel harmonics alone were never really an issue as rifles were designed to shoot man-sized targets at relatively short ranges. It was only when a bayonet was fixed to the end of a rifle's barrel that barrel harmonics had any real bearing.

Firing a rifle with its bayonet fixed did not affect the rifle's inherent accuracy, but it did change the mean point of impact of any group of shots. Consequently, the soldier had to understand this and correct his aim when firing with a fixed bayonet. When effective rifles for mass issue were developed c.1850, the bayonet was attached directly to the rifle's muzzle, normally on the right-hand side. Given that many bayonets – particularly *yataghans* – were of similar weight to the barrel itself, this additional weight on just one side of the barrel must have made for peculiar barrel harmonics. This made little difference in reality, however, as rifle fire with fixed bayonets would have been conducted only at very close ranges.

Brazing a bayonet lug directly onto the barrel led to some concerns that the heat generated might damage the barrel's fabric and that rough use might either break the barrel off or otherwise damage it. Consequently, in 1858 Britain adopted the 'Short Rifle, Pattern 1856, Bar on Band' on which the bar on the muzzle band was reinforced by a cross-pin running through the stock and band. Although this rifle officially came into service, relatively few – about 30,000 – were manufactured. The German 11mm M1871 and 7.92mm M1888 Mauser rifles used a similar system, as did many of the Austro-Hungarian Mannlicher rifles and the British .45 Martini-Henry Mk IV rifle. Most other nations used either socket bayonets or found that the bar on the barrel was perfectly acceptable. Clearly, the reason for putting the bayonet bar on the top band had nothing to do with barrel harmonics and was solely concerned with mitigating any damage incurred from rough usage.

Then, in 1888, Britain adopted the .303 Lee-Metford Mk I rifle. This carried a knife bayonet with a double-edged blade 11.8in

long and mounted on a bar protruding from the nose cap. The bar went into a T-section slot in the pommel and further support was provided by a ring on the guard which slipped over the barrel. This bayonet was one of the better designs of its time: it had a stiff blade that was a good penetrator and it did not suffer from the clumsiness that bedevilled many longer-bladed bayonets. In the decade that followed, every major power (except France and Russia) followed suit and adopted a rifle with the bayonet mounted under the muzzle. Again, this choice does not appear to have been dictated by barrel harmonics, but rather ease of handling. Many bayonets dispensed with the barrel ring altogether and relied on the support given by the bar alone. This was the case with the 7.92mm Mauser M1898 series of rifles and carbines, although there was a partial ring on the earlier models of bayonet.

In 1891, Russia adopted the 7.62mm Mosin-Nagant M1891 rifle with its distinctive socket bayonet, known as the *Schtyk*. As Russian tactical doctrine required the bayonet to be fixed at all times, the M1891 rifles were factory-zeroed with fixed bayonets. Certainly, anecdotal accounts from modern shooters suggest that the M1891 rifle shoots better with a fixed bayonet. As a consequence of it being permanently fixed, the Russians did not issue a scabbard for the *Schtyk*. Many thousands of M1891 rifles were captured during World War I by the Germans and Austrians and issued to their own forces, sheet-metal or leather scabbards being provided.

The fixing system for the French Mle 1886 Lebel bayonet was unique in that it relied on a pommel cup and muzzle ring. In addition, a small rectangular locator stud under the barrel engaged with a slot in the bayonet's hilt to ensure correct positioning and to prevent any rotation.



Austro-Hungarian M1895 Mannlicher short rifle bayonet made by Österreichische Waffenfabriksgesellschaft (OEWG). Note the auxiliary front sight to compensate for any change in the mean point of impact when firing with the fixed bayonet. The cutting edge is uppermost when the bayonet is fixed to encourage an upward-cutting action after perforation. The blade is 9.75in long. (Chantel Taylor)

British recruits in shirt-sleeves practise the High Point during basic training, somewhere in northern England in 1915. They are armed with Canadian .303 M1910 Ross rifles and bayonets. Adverse conditions in the trenches proved too much for the fragile and poorly built Ross rifle. Withdrawn from front-line service in France, many saw use training recruits in the UK. (Print Collector/Getty Images)



dispersed from the field of battle. If enough panic can be created within enemy forces, entire units and even armies cease to be militarily cohesive.

The intimidation factor is compounded when well-trained troops charge an enemy whose training is less good, e.g. 'green' troops, civilian levies or troops whose morale is poor – for whatever reason. Troops who have a reputation for closing with the bayonet will invariably prevail over those who have lost the will to fight.

The use of the bayonet also fosters the aggressive spirit whether in the attack or defence. It engenders resolution and confidence and raises

Two US Army African-American soldiers at bayonet practice, c.1917. The man on the left has a .30-06 Model 1917 rifle and sword bayonet. His opponent (possibly an instructor) has a stick with a padded end, a standard aid in bayonet practice for many armies at that time. (© CORBIS/Corbis via Getty Images)





morale. It is small wonder that a commander faced with either an attack that is becoming bogged down or with troops whose backs are to the wall gives the command to 'Fix Bayonets'. A bayonet charge has always offered the possibility of resolving a military stalemate, one way or another.

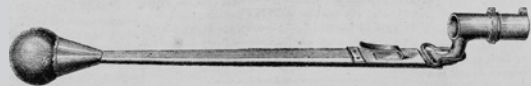
In this 1917 recruiting poster, a Marine raises his .30-06 Model 1903 Springfield rifle and Model 1905 Springfield sword bayonet aloft. (Library of Congress, LC-USZC4-9024)

BRITISH BAYONET FIGHTING MANUALS

The only scientific approach to bayonet fighting written in English before 1849 was Anthony Gordon's *Treatise on the Science of Defence for the Sword, Bayonet and Pike in Close Action*, written in 1805, which is principally concerned with maintaining the integrity of the infantry square against cavalry attack. Once breached, this essentially defensive formation could be destroyed piecemeal. Consequently, it was imperative to present a steel-tipped 'hedge' of bayonets to deter enemy horsemen; and if this could be done in an aggressive rather than simply a passive manner, then so much the better. This was the point of Gordon's book.

The first scientific manual of bayonet fighting in the British Army was published by 1849, but the most commonly encountered edition of *Angelo's Bayonet Exercise*, written by master of fencing Henry C. Angelo, who had been appointed Superintendent of Sword Exercise in the British Army and Navy in 1833, is the 1857 reprint (Angelo 2008). Angelo was the grandson of the famous Italian sword and fencing master, Domenico Angelo, who dominated English fencing in Georgian England. In turn, Domenico's son Henry produced manuals on the use of military swords. Henry produced nothing scientific on bayonet fighting, however, which is unsurprising because the musket with its fixed bayonet was still regarded primarily as a defensive formation weapon, whereas sword combat was conducted offensively against an individual opponent. It was considered sufficient to teach massed infantrymen to present a steel-tipped 'fence' with their bayonets to deter man or horse from pressing home an attack. Conversely, the cavalry trooper, seaman or infantry officer needed scientific exercises if he was to ply his sabre, cutlass or spadroon (a type of light sword with a straight-edged blade) in an effective manner.

For all that *Angelo's Bayonet Exercise* is described as a manual, its author was at pains to dispel that notion. Instead, he saw it as an exercise regime to loosen up the infantry soldier's



J.G. Ernst patented his 'Improvement in Removeable Bayonet Guards' on 5 August 1862. It comprised a spring-loaded sheath tipped with a gutta-percha ball which could be slipped over the blade of any socket bayonet to make it safe for practice. The engraving shows two Zouaves using Ernst guards while bayonet fencing under the supervision of an officer. The Ernst guard was not commercially successful as no extant specimens are known. (Kean Collection/Getty Images)

physique in order to allow him to make the best possible use of his musket and bayonet. He stresses that in the existing drill books there was no individual bayonet instruction except for the 'Charge Bayonet' position and the method of fixing and removing the bayonet, and that the individual was left to use the bayonet as he wished (Angelo 1857: 9). Having expounded the virtues of his exercises, Angelo concludes his introduction by remarking that they brought the arms, legs and body into action and thereby improved the suppleness of the limbs (Angelo 1857: 10).

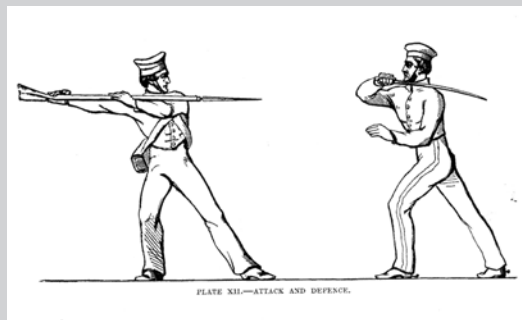
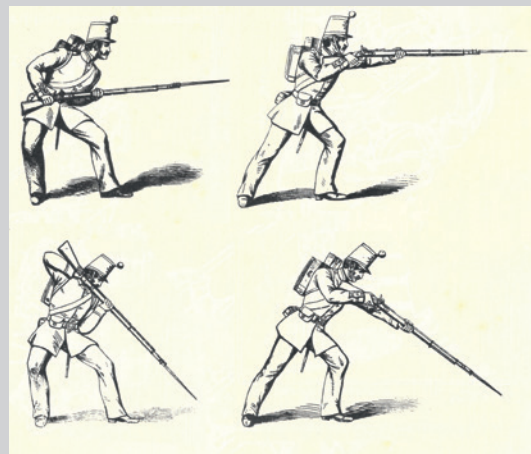


Plate XII from *Angelo's Bayonet Exercise* by Henry C. Angelo, 1857. The emphasis is on individual combat with the bayonet, rather than simply being part of a static formation. (Author's Collection)



This plate from *Field Exercise and Evolutions of Infantry* (War Office 1867) shows individual fighting postures. (Author's Collection)

Angelo's Bayonet Exercise should not be regarded as merely a system of calisthenics, however. The concluding section, 'General Observations', includes several practical instructions for individual bayonet fighting. Angelo emphasizes that any defence against a sabre-armed cavalryman should be conducted from the opponent's left-hand side in order to reduce the effectiveness of the sabre. When dealing with a lancer, the opposite was true, albeit that caution was urged due to the longer 'reach' of the lance. Perhaps the most interesting part of Angelo's work is the recommendation for improvising fencing muskets using the ramrod. He notes that a ramrod with spring attached could be inserted into the musket barrel, with a length equal to that of a bayonet protruding with a 'button' of gutta-percha on the end, in the style of a fencing foil; he goes on to stress the importance of wearing a mask (Angelo 1857: 39). What form this spring took is not explained; presumably, suitable examples were either procured from a local tradesman or produced by skilled metal workers on the regimental staff. Whatever the actual form, the spring must have been able to be slipped onto the shaft of the rammer and then compressed enough

to allow it to slide up and down the bore. The gutta-percha 'button' (gutta-percha is a naturally occurring polymer of isoprene which forms a rubber-like elastic paste) would be easy enough to manufacture at unit level as that substance was in widespread use in Britain at the time for other purposes.

While Angelo's improvised fencing apparatus is ingenious, it was rather impractical. In any case, it was short-lived as in 1863 the British Army adopted a purpose-built fencing musket designed by Wilkinson of Pall Mall. The overarching message in *Angelo's Bayonet Exercise* is that an infantryman competent in bayonet fighting will have much more self-confidence generally, but also develop his strength, aggression and fighting skill (Angelo 1857: 35). Angelo's greatest legacy was the development of fighting spirit and self-determination within an individual infantryman armed with musket and bayonet. Hitherto, the emphasis had been on the infantryman's defensive capability in a large formation. All subsequent manuals on bayonet fighting emphasized that a confident and well-trained infantryman could rely on his bayonet for both.



Cadets at the Royal Military College Sandhurst parade outside the gymnasium ready for bayonet practice in 1938. They carry Mark X fencing muskets with spring-loaded plungers instead of blades, and wear face masks and padded body armour to prevent injury. By this date, gymnasium bayonet practice was more about promoting physical development than ever it was about learning to fence with a rifle and bayonet. (Fox Photos/Getty Images)

An Italian MVSN fascist militiaman jumps over a rack of 6.5mm M1891 Mannlicher-Carcano carbines with their folding bayonets deployed, c.1936. (Universal History Archive/Universal Images Group via Getty Images)



Perhaps the most important underlying factor in the bayonet's success was that its earliest appearance on the battlefield coincided with the rapid decline in the wearing of armour. In a hand-to-hand encounter, therefore, both sides were equally susceptible to the bayonet's penetrative capabilities.

BAYONET CASUALTIES

Statistics pertaining to the number of casualties actually caused by bayonet thrusts are generally misleading because they are compiled from information on the types of wounded men's injuries during hospital treatment. They cannot, therefore, include those men killed by the bayonet in battle who were probably buried where they fell. Consequently, any percentage statistic given for the total of bayonet casualties in a war or action is incomplete. Nonetheless, there is an emerging theme from these figures, however incomplete they may be, namely that they are all very small. Artillery and small-arms fire remained the major killers.

The reason for the small proportion of bayonet casualties is self-evident: few troops were willing to stand and fight hand to hand if charged. George J. Guthrie, a military surgeon during the Napoleonic Wars, noted the 'great delusion' among the British concerning the importance of the bayonet, asserting that in contrast to the popular view,

OPPOSITE

A hand-tinted ambrotype of a Union private, c.1862. He is armed with a .58 Model 1841 'Mississippi' short rifle and Model 1855 sword bayonet. A private-purchase revolver is tucked into his Model 1851 belt. (Library of Congress, LC-DIG-ppmsca-26911)





A British sergeant-major (at left) shows a US Army recruit the technique of 'Shortening Arms' at Camp Dick, Texas, c.1917. The instructor is armed with an obsolete .30-40 Model 1892 Krag-Jørgensen rifle and bayonet, in order to release more modern rifles for active service. (© CORBIS/Corbis via Getty Images)

opposing infantry units in line formation never fought one another with bayonets, because one side invariably retreated as the other approached (quoted in Scott 2010: 344). This unwillingness to stand and fight stems from a single factor: by the time the bayonet was universally adopted in Europe, infantry had shed all of its protective armour. The bayonet's psychological effect stemmed solely from the fact that both protagonists were unarmoured and therefore equally vulnerable to it. Even a partially armoured man had little to fear from it.

The early success of the bayonet was directly attributable to the increasing efficiency of firearms in defeating armour. Smaller calibres and improved gunpowder led to higher velocities and better penetration. Eventually, musket-proof armour became so heavy that it was virtually impossible to move in it. Consequently, there was no point in the infantry wearing armour at all. The bayonet thrived in such an environment; and it flows from this that the bayonet was at its most effective against fleeing, broken troops. For example, Private Tom Kitcher, serving in Meredith's Regiment at the battle of Ramillies (23 May 1706) during the War of the Spanish Succession, recalled using his bayonet against fleeing French troops while clearing enemy outposts (Falkner 2014: 128).

Casualties among European armies normally show a relatively small number of dead along with a larger number of wounded and a much larger number taken prisoner. In the case of Imperial Japanese forces in

THE *YATAGHAN* – AN OVERRATED WEAPON?

As well as looking impressive on a rifle for parades and reviews, the *yataghan* bayonet was undoubtedly regarded as a short sword when not in the fixed position. Reconstructive experiments conducted by the author with a French 11mm Mle 1866 Chassepot *yataghan* found that it was not well adapted for use in the hand. When used for thrusting, there was nowhere for the thumb to rest other than the muzzle ring, which proved uncomfortable. When used for cutting, the straight edges on the back of the hilt proved equally uncomfortable to the hand: any significant impact drove the edges into the lower part of the palm. By contrast, those *yataghan* bayonets with rounded grips made from either chequered wood or leather were comfortable, making the bayonet into a useful short sword.

Richard F. Burton was scathing about the *yataghan* bayonet:

As a bayonet it lost all its distinctive excellence: the forward weight, so valuable in cutting with the hand, made it heavy and unmanageable at the end of a musket, and none but the strongest arms could use it, especially when the thrust had to be 'lanced out'. Yet it lasted for a quarter of a century and only in 1875 was it superseded by the triangular weapon attached to the fusil Gras. (Burton 1884: 134)

He goes on to say: 'so, the Frenchman would transform the bayonet into a *multum in parvo* [a great deal in a small space], a Sword, a saw, a *coupe-choux* [cabbage cutter] in fact everything that a bayonet is not and ought not to be' (Burton 1884: 164). Another equally strident critic was John Latham of the London sword-cutlers, Wilkinson & Son. In a lecture given in 1862 to the Royal United Service Institution and published in 1863, Latham commented that the placing of a *yataghan* blade at the end of a rifle barrel meant that its weight made it unmanageable, and less effective than a socket bayonet (Latham 1863: 419).

Even when attached to a rifle, the *yataghan* bayonet was never a good penetrator. An account exists of a German infantry officer, Hauptmann Oehlmann of Grenadier-Regiment *Kronprinz* (1. Ostpreußisches) Nr. 1, who was wounded in the chest by a French *yataghan* at the battle of Noisseville (31 August 1870) during the Franco-Prussian War. Although his injury was severe, Oehlmann recovered because a leather-framed family photograph in his tunic pocket absorbed part of the force of the bayonet thrust. He might have been less fortunate had the wound been inflicted by a conventional socket bayonet, which was a far better penetrator (Alston-Roberts-West 2019: 161).



Original photograph of French Zouaves and grenadiers in camp, c.1856. The Zouave in the right foreground is carrying a Mle 1842 *yataghan* bayonet. This bayonet fitted several French rifle-muskets, including the Mle 1840 and the Mle 1853. It is suspended from the soldier's waist-belt by a two-branched leather frog. The Zouaves wear the fez-like *chechia* cap, one with the addition of a white turban. While the grenadiers retain their fringed epaulettes, the tassels, cords and plumes that normally adorned their bearskin caps have been removed on campaign. (Anne S.K. Brown Military Collection, Brown University Library)



Three Russian soldiers from the Women's Battalion of Death, 1917. They are armed with 7.62mm Mosin-Nagant M1891 rifles with the characteristic socket bayonet known as the *Schtyck*. (George Rinhart/Corbis via Getty Images)

World War II, however, this was reversed with a large number of dead, a much smaller number of wounded and very few taken prisoner. The bayonet's main negative impact during World War II was to cause very high casualty rates among the Japanese by virtue of its persistent use.

BAYONETS BEYOND THE BATTLEFIELD

The bayonet has always played a significant role in the ceremonial duties of military units. In Britain, those units which have the freedom of a city may march through it with 'colours flying, drums beating, and bayonets fixed'. Fixed bayonets symbolize a unit's readiness for battle. Those bayonets reserved for ceremonial duties tend to be chromium-plated (or similar) to enhance their appearance. Those carried by colour escorts often have blunted tips to prevent damage to delicate fabric fluttering in the breeze.

Prior to the foundation of civilian police forces, the military were called out to deal with civil unrest. Troops with fixed bayonets were always intimidating to a crowd armed with only improvised weapons. This psychological effect made a large contribution to the rapid restoration of public order. When police forces received their own purpose-built firearms, many types of longarm were issued with bayonets, e.g. the .653 British Constabulary Carbine of 1840. The use of fixed bayonets in matters of civil unrest achieved ultimate notoriety in early May 1970, when the Ohio Army National Guard used

PLUG BAYONETS FOR HUNTING

Some civilian sporting firearms were made with plug bayonets, which would act both as a useful knife and an emergency weapon when facing dangerous game such as boar or bear. This practice died out in most of Europe except Spain, where the bayonet evolved into a hunting knife, and there are several paintings by Francisco de Goya (1746–1828) which show Spanish kings in hunting costume carrying them. The Spanish plug bayonet-style

hunting knife survived until the end of the 19th century. The reason for this retention is unclear, but it was probably the result of innate conservatism. Similarly, the Spanish retained firearms with distinctively shaped stocks and lock mechanisms, suggesting that the Iberian Peninsula was not receptive to general European influences. The retention of the plug bayonet did not, however, persist in Spanish-speaking parts of the Americas.



This ornate Spanish hunting knife and scabbard were made by Salvator Larruscain of Madrid and dated 1852. Spanish hunting knives retained the format of the plug bayonet until the end of the 19th century. Both knife and scabbard are chiselled with scrolling foliage, hounds, masks and hunting scenes. The chiselling is selectively gold damascened to create a contrast between the yellow of the gold and the silver of the steel. (© Royal Armouries X.1370)



Dating from c.1830, this Spanish hunting knife features a broad double-edged blade, hardwood grip and steel quillons in the form of fluted architectural columns. The scabbard is covered in shagreen (shark or ray skin). (© Royal Armouries XXII.224)



Bayonets have often been used to intimidate crowds during public-order incidents. Here, Prussian police carry 7.92mm Mauser Gew 98 rifles with fixed bayonets, one of which is an S 98/05 'butcher knife', probably during the Cuno Strikes of August 1923. (ullstein bild/ullstein bild via Getty Images)

bayonets to subdue anti-Vietnam War protesters at Kent State University. The Guardsmen were armed with .30-06 M1 Garand rifles and M5 knife bayonets which they used without hesitation on the unarmed student protesters. One student who tried to evade the Guardsmen was bayoneted in the back; he ran from the scene dripping blood (Eszterhas 1970: 122).



US National Guardsmen armed with .30-06 M1 Garand rifles fitted with M1 bayonets are pictured during public unrest, 1964. (Truman Moore/The LIFE Images Collection via Getty Images/Getty Images)



CONCLUSION

The bayonet has been the infantryman's constant companion for the last 375 years or so. The reason for this longevity is the inherent simplicity of the bayonet concept. While its form may have altered over time, its essential nature has not. The plug bayonet of a soldier in Charles II's army shares the same function as the SA80 bayonet of a soldier in Queen Elizabeth II's army.

Persistent reliance on the bayonet led to increased casualties as artillery and rifles improved. Emplaced enemy troops could only be driven out of their works with heavy losses to the attackers. Bayonets may have fostered an aggressive spirit, but this could not prevail against long-range projectile technology, whether shrapnel balls, shell fragments or rifle bullets. Similarly, the fighting spirit so beloved of general officers was entirely useless against the volume of fire produced by gas-operated machine guns.

Though the bayonet is an irrelevance in modern warfare, it is highly unlikely that it will be completely discarded. It is a useful utility knife

Austro-Hungarian M95
Mannlicher bayonet for NCOs.
This model can be distinguished
from those bayonets intended for
privates by its hooked quillon and
pommel loop for the bayonet knot.
(© Royal Armouries PR.2697)





US soldiers in the Philippines, c.1899. They are armed with .45-70 Model 1873 Springfield 'trapdoor' rifles and socket bayonets. (Hulton Archive/Getty Images)

OPPOSITE

This Union infantryman of the American Civil War is armed with a .58 Model 1861 Springfield rifle-musket and Model 1855 socket bayonet. (Library of Congress LC-DIG-ppmsca-27450)

and handy multi-function tool that can be used as a weapon when all else has failed. Perhaps that is the reason why the world's militaries cling to it – in the final analysis, it is a cheap insurance policy that reassures the individual soldier. Equally, its use in training not only adds to a recruit's physical condition but inculcates the aggressive spirit so necessary in any soldier. Consequently, it is a racing certainty that the bayonet will survive as long as armies continue to deploy 'boots on the ground'.



GLOSSARY

BACK	The upper edge of the blade opposite the cutting edge.
BAYONET BAR	Short 'T'-section (normally) tenon which engages with the mortise, either affixed to the barrel or upper band.
CHAPE	Lower metal fitting to a scabbard. Prevents the blade from being exposed.
FLASH GUARD	Sheet-steel fitting to protect the grips from the muzzle flash on some rifles.
FLUTES	'D'-section longitudinal grooves in the blade of a socket bayonet.
FROG	Leather or fabric hanger incorporating a loop to allow the bayonet and scabbard to be hung from a waist belt.
FROG BUTTON	Stud on the locket which engages with the hole in the throat of the frog to secure the bayonet scabbard in it.
FULLER	Longitudinal groove in a blade intended to reduce weight without losing strength.
GRIP	Area of the hilt gripped by the hand. Normally wood, leather, plastic or metal. May be ribbed or chequered to improve purchase.
GUARD	Cross bar below the hilt designed to afford some protection to the hand when the bayonet is used manually.
HILT	Handle of the bayonet.
KNUCKLE-BOW	Metal band extending from the pommel to the guard on some sword bayonets.
LEAF SPRING	Flat piece of spring steel running longitudinally along the hilt, the top of which bears on the locking catch.
LOCKET	Upper metal fitting to the scabbard. Incorporates a pair of throat spring 'ears'.
LOCKING CATCH	Transverse spring-loaded bar which engages in a cut-out on the bayonet bar to lock it in place when fixed.
LOCKING RING	Rotating ring on the socket which engages with a lug or the foresight to lock the bayonet in place when fixed on the firearm's muzzle. Those situated at the lower end of the socket are known as 'basal', those in the middle as 'median'.
LOCKING SLOT	Longitudinal slot, often in the form of a stylized 'Z', which locks the socket by engaging a stud on the firearm's muzzle.
MORTISE	'T'-section (normally) slot on the back of the hilt into which the bayonet bar fits.
MUZZLE RING	Circular projection on the guard that slips over the firearm's muzzle to support the bayonet.
OIL HOLE	Small hole in grip plates or pommel to allow lubrication of the locking mechanism without recourse to removing grips.
POMMEL	Upper part of the hilt. Originally a counterweight to the blade on a sword.
QUILLON	Curved projection emerging from the opposite end of the guard to the muzzle ring.
RICASSO	Short, unsharpened section of the blade immediately below the guard.
SCABBARD	Protective cover for the blade.
SHOULDER	Curved section which joins the blade and socket.
SOCKET	Tubular 'handle' which fits over the firearm's muzzle.
SOCKET COLLAR	Reinforced ring at lower end of the socket, often engaging a locking catch extending from the firearm's forend cap.
SPEAR POINT	Grinding style for blades in which a small portion of the back is ground back to enhance the blade's penetrative capability. This portion is termed the 'false edge'.
TEMPER	Heat-treatment process for the blade balancing elasticity against hardness. A properly tempered blade will flex and return to its original shape without snapping.
THROAT	Inset carrying two spring 'ears' at the upper end of the scabbard. The 'ears' grip the blade, preventing its accidental loss from the scabbard.
YATAGHAN	Recurved single-edged short sword prevalent in Asia Minor and the Balkans from the mid-16th to the late 19th centuries.

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A modern US soldier with M9 multi-purpose knife bayonet mounted on his 5.56mm M4 carbine. Although the rifle and its image-intensifying sight represent the zenith of military small-arms technology, the essential form and function of the bayonet has not developed over the 375 years of its existence. (Brooks Kraft LLC/Sigma via Getty Images)

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Front cover, above: German S 98 sword bayonet with quill-backed 20.5in blade. (Chantel Taylor)

Front cover, below: A soldier of 12th Battalion, The Hampshire Regiment, wields his SMLE rifle with Pattern 1907 bayonet during training near Bournemouth, Dorset, in June 1941. (© IWM H 10633)

Title-page photograph: Pictured in 1941, US recruits armed with .30-06 Model 1903 Springfield rifles and Model 1905 sword bayonets assume the classic 'On Guard' position with knees slightly bent, right hand gripping the stock wrist and left hand well forwards and immediately behind the bayonet mounting bar. Achieving the correct stance for this basic posture was vital for a recruit as it was the foundation for all other bayonet fighting positions. (Library of Congress LC-USW33-000141-ZE)